A Cross in this space is a reminder that your Subscription to the Journal expires with this number.

ANNUAL RATES OF SUBSCRIPTION.
Farmers, Graziers, Horticulturists, and Schools of Art FREE on prepayment of 1/- to cover postage. Members of Agricultural Societies, 5/-, including postage. General Public, 10/-, including postage.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. XIX. APRIL, 1923. PART 4.

Event and Comment.

The Current Issue.

In this issue many matters of importance affecting rural industries are fully dealt with. Special consideration has been given to the organisation of the agricultural industry in Queensland, and attention is called to the second article of the series covering an account of Californian co-operative methods and their applicability to Queensland. In this contribution Mr. J. D. Story's American investigations are readably set out. The entrance of the Queensland Producers' Association on its second year fittingly calls for a review of its functions and actual achievements, though, admittedly, the first year was devoted largely to organising preliminaries and spade work. In the report of the delegation from the recent Sugar Conference to Melbourne current sugar questions are well covered, and canegrowers will find much other matter to interest them in Mr. Edmund Jarvis's Science Notes and the regular field reports. Cotton, Queensland's coming industry, is well served with seasonable comment and instruction. General agriculture is served by timely notes on silage by the Director of Agriculture, Mr. H. C. Quodling. Topical illustrations are, as usual, a notable and popular feature. Much other interesting matter makes the April Journal a very readable number.

Farm Bureaux.

In the course of the first series of notes on Mr. Story's observations of Californian co-operative practice, published in the March Journal, the American farm bureaux system was fully described. It is a system well worthy of the closest study by those concerned in extending the operations of the Queensland Producers' Association. What has been accomplished in other countries in the way of agricultural organisation can surely be done in Queensland, and the experience of farmers in other parts of the world is valuable as an aid in evolving a solution of our own rural problems.

The Local Producers' Association.

The local producers' association as well as the district council possesses the possibility of becoming largely an educational agency in the broadest sense of the term. One of its best contributions to the welfare of the agricultural industry will surely be the dissemination, in an organised way, of methods of better farming practice as its members see it. When a need arises it will, as an organised unit, be in a good position to handle local and general economic problems in a practical and business-like way. The local association will, of course, comprehend clearly that in order to be an agent of progress it must also be a vehicle of work. It must be a creative, driving force. It must have a definite programme and definite projects. It must lay the tapes for attack on problems confronting the industry, and it will proceed precisely as fast as the members are willing to devote time and attention in tackling those problems. When an objective is reached, digging in and consolidation are essential. No association is worth its salt unless it does something. The mere passing of resolutions is seldom effective as a means of progress. Many organisations have been bogged in the morass of negation. Their members gradually worked themselves up into a state of mind whereby they somehow felt that by carrying resolutions they caused the world to advance. Days were spent in appointing committees and wrangling over the wording of flowing sentences, and the return home was doubtlessly lightened by a glowing sense of something attempted, something done, but without the knowledge that the sun had set upon a world no different from that upon which it had risen. As in all other enterprises utility must replace futility.

A Basis Upon Which to Build.

To be effective a Local Producers' Association must secure the active co-operative interest and work of all its members. No committee or board of directors alone can carry a local association forward to success. The greater the number of individuals involved in solving a problem the more certain it is that it will be solved correctly and the quicker will that solution be reached. The work of an association should be built up not only on a district programme, but on a community, or even an individual, programme. Members should lay down, at the beginning of each term, not only the part the district council is going to take in a programme of agricultural progress, not only the work which each centre is going to do and the projects it is going to further, but how farmers individually are going to act in aiding in the plan—what action they personally are to take in the enterprise. Built upon such a basis, the Local Producers' Association must become one of the most potent factors in rural life.

The Prickly-pear Commission.

The Royal Commission appointed by the State Government to inquire into the spread of the prickly-pear pest in Queensland and methods of controlling it has been busy, in the course of the month, taking evidence in Brisbane from scientists, departmental experts, and others. Further evidence is being taken in centres along the Western line, and it is the purpose of the Commission to visit pear-infested country and interview the holders. Subsequently, visits will be paid to other parts of the State where evidence will be taken and investigations made. Later, the Commission may take additional evidence if it is available in the capital.

The Cotton Guarantee.

"The cotton guarantee for the 1924 season has been fixed at 5d. per lb. for cotton of good quality, even though the staple is less in length than 1¼ inches." The Premier (Hon. E. G. Theodore) made this announcement recently and added:—"The Government Cotton Expert (Mr. C. Evans), after his tour through the cotton-growing areas, and his consideration of the whole question, has advised the Government that the guarantee for the 1924 crop should be reconsidered with a view to giving better terms to the growers. He pointed out that the existing conditions involved the payment of 5½d. per lb. for seed cotton of not less than 1¼-inch staple and 4½d. per lb. for cotton of shorter staple, but of good quality. He says that the only type of cotton that will produce a 1¼-inch staple is Durango, and there will not be sufficient

of this seed to distribute amongst the growers. It will be clear, therefore, that under the existing terms of the guarantee the growers could only look for 4½d. per lb. for the 1924 crop. He has recommended, and the Government has agreed, that the guarantee should be 5d. per lb. for all cotton, even though it is less than 1¼-inch staple, for the season 1924. In the meantime the Department of Agriculture will continue to control the production of Durango seed cotton, with a view to having sufficient of this seed available for the 1925 season. The Government has communicated with the Commonwealth Government asking its concurrence with the terms of the new guarantee. I anticipate that they will agree, and therefore give further encouragement to the cotton growers to make early preparation for the 1924 season."

Cotton Grading.

In the course of a recent Press interview the Minister for Agriculture and Stock (Hon. W. N. Gillies) said that the work of classification and grading of cotton is being taken in hand. Government cotton advisers have been paying special attention to this question, for it is essential that the article for sale shall be presented to the oversea buyers in the most attractive way. If this were not done, the worst bale of cotton shipped would most likely determine the price of the lot. This action will not in any way interfere with or alter the conditions of the Government guarantee. Mr Gillies stated further that, as a result of advice received from the experts, steps were to be taken at once to select areas of land, with soil typical of the districts where cotton was growing, where Durango and other seed would be raised on a large scale. In the course of a year or two, by this scheme, the whole of the requirements of the growers could be supplied with best known varieties of seed.

The Value of Pasteurisation.

The report of the South Burnett Co-operative Dairy Company contains an interesting reference to the value of pasteurisation, and states that since the company installed its pasteurising plant very satisfactory results have been achieved. The following comparison is made from the figures supplied:—

Butter manufactured in January, 1922. (Not pasteurised.)		Butter manufactured in January, 1923. (Pasteurised.)	
Choicest	Nil	Choicest	34 p.c.
First	40 p.c.	First	61 p.c.
Second	32 p.c.	Second	5 p.c.
Third	18 p.c.		
Pastry	10 p.c.		

These results were achieved under similar weather conditions.

Cotton Pests.

Discussing cotton pests with a Press interviewer recently, Mr. C. Evans (Cotton Adviser to the Queensland Government) said that the pink boll worm, which is unknown in Queensland, must not be confused with the boll weevil, which is an entirely different insect and the cause of such enormous damage in the United States of America. The boll weevil, so far as is known, is absolutely confined to the cotton States of U.S.A. and Mexico. The pink boll worm, on the other hand, is a native of India, where it has been known and studied for many years. The pink boll worm was introduced into Egypt about 1910 in some bales of cotton imported from India for the Alexandria spinning mills. These bales contained some seed which had passed through the gin, and this seed carried the larvæ of the pest in the resting stage. The pest spread rapidly through the Nile Delta and seemingly became very destructive under Egyptian conditions. The Egyptian experience and experience of the pest in other countries emphasised the care that must be taken in the importation of cotton seed from abroad, and the necessity for strong and strictly observed quarantine regulations. Any person who imports seed through the post privately may unwittingly introduce a pest of this sort into Queensland, and so be the means of causing the greatest damage to our young and promising cotton-growing industry.

ORGANISATION OF THE AGRICULTURAL INDUSTRY IN QUEENSLAND—II.

By J. D. STORY, Chairman Administrative Committee, Council of Agriculture; and J. F. F. REID, Editor of Publications, Department of Agriculture and Stock.

In the first article of this series, published in the March Journal, the American Farm Bureau Organisation was described and compared with the plan of the Queensland Producers' Association. In this instalment various phases of American marketing methods, relating more particularly to fruit, but capable more or less of diversified application, are discussed.—Ed.

GRADING, PACKING, AND MARKETING.

In a previous article the organisation of agriculture has been dealt with, and the Queensland Producers' Association has been compared with the American Farm Bureaux Organisation. The farmers of America realise that the marketing problem is one of the greatest and most important questions they have to meet for many years. The farmer had been accepting whatever price he had been offered, and paid what he had been asked, but he realised that there was somehow, somewhere, too broad a margin between what he got and what the consumer paid. Hence the farmers got together to try to overcome their marketing difficulties.

In most of the States, Government market departments have been established to assist the producers, and, though the operation of these departments vary slightly in the different States, their general functions are similar—namely, to investigate market conditions; to furnish advice and assistance to producers, distributors, and consumers; to promote effectual and economical methods of marketing; to establish, administer, and enforce standards of weights, grades, and measures; to assist in the organisation and development of co-operative associations; and to collect and distribute market information. Many of the State departments issue daily market reports, and publish weekly, fortnightly, or monthly bulletins dealing with general marketing questions.

The Question of Distribution.

No matter how scientific food production may become in the actual labour processes, it cannot attract or hold the efforts of its followers unless adequate provision can be made for distribution of products. Though in the past the organisation of agriculture has not got very far beyond the gateway of the farm, the same is not true of other industries. The factory, for example, would not abandon its goods as soon as they were manufactured, but the premier ability of such a concern would be included in its selling organisation, and that organisation would be supplied with the capital necessary for efficient working.

In many instances the farmer has waited for some outside agency to solve his problems for him, and this waiting has not improved his own condition or that of the consumer. It must be remembered that such outside organisations do not undertake projects for the love of the work; these organisations are not so much concerned in the expenses incurred by the farmer in producing and sending his goods to market as they are concerned in selling the goods at a price which will return a commission.

American Experience.

The consensus of opinion in California now is that the State Market Division can be used to no better advantage than in assisting in the organisation and maintenance of associations for the co-operative marketing of the food supply of the State.

A survey was made in 1919 comparing wholesale prices of organised products with prices of unorganised products, and it was found that the prices of unorganised products had increased over the 1914 prices 26 per cent. more than the prices of organised products.

Co-operative selling by farmers is not a radical departure from, but is rather the adoption of, accepted business practice in the manufacturing world. The average farmer, engaged as he is in actual production, cannot be expected individually to

organise efficient marketing machinery, but he can organise very satisfactorily in conjunction with his fellows, and employ, to attend to the problems of distribution, the same high grade type of man as is employed by the manufacturer.

So far as can be gathered, the solution of marketing problems, as applied to agricultural products generally, has not yet been solved, and no one organisation or group of associations has been established to take charge of the whole of the marketing. In various States, however, various organisations have achieved success in the marketing of certain products for their members—in some instances such organisations handle only a particular product, and in others different products of a similar kind.

In the State of California, for example, over thirty associations last year attended to the marketing of approximately 50 per cent. of the total agricultural and horticultural output, such percentage being of the aggregate value of 250,000,000 dollars. For the purpose of co-ordination and continued assistance the Director of Markets arranges with each association, which he assists in organising, that he shall have the right to nominate one of the directors; he does so in order that he may keep in touch with the activities and the policy of the association; usually he nominates a man of proved business ability.

Factors Affecting the Problems of Marketing and Distribution.

In dealing generally with the marketing problems, and taking it for granted that good-quality products can be produced, there are a number of factors which must be taken into consideration—harvesting, grading, packing, knowledge of market requirements or demand, transport arrangements, selling agencies, and advertising. Though these factors are necessarily inter-related, let us divide them for purposes of study into two sections—first, those dealing with the preparation of products for market; and, second, those relating to the organisation of the selling of the products so prepared. As a concrete example of successful co-operative marketing as applied to a particular class of product let us consider the methods of the California Fruit Growers' Exchange in the marketing of citrus fruit.

Californian Experience prior to Co-operation.

Though the citrus industry at California is now fairly established, it had a very small beginning and experienced many difficulties. In the early history of the industry lack of co-operation and systematic marketing methods made the future of citrus crops uncertain. The fruit was carelessly handled, irregularly graded, packed in slipshod manner, and shipped to this or that market indiscriminately. Under such conditions the fruit kept poorly, markets were alternately glutted and under-supplied, and with increasing production the marketing abilities of the small distributors were taxed to the utmost and the business was hazardous to fruit merchants and growers alike.

In 1892-3 growers, in many instances, not only furnished their entire crop for nothing, but were also required to pay the freight and packing charges which the gross sale of their fruit did not cover. It was frequently the case that the larger the crop the more the grower was indebted to his packer at the end of the season. A continuance of these conditions would assuredly have forced many growers to dig up their trees.

Genesis of the Californian Fruitgrowers' Exchange.

Following upon this year of disaster the growers held a convention, and decided to work out the marketing problems amongst themselves.

As a result of that convention, the organisation of associations and district exchanges was effected in all the principal citrus fruit districts, and it was arranged that the packing should be done by the associations at cost, and that the marketing should be managed through an executive committee composed of one member from each district. The results during the first two seasons were not entirely satisfactory, and the central exchange was organised—that organisation has since developed into the present Californian Fruit Growers' Exchange.

The exchange system was simple and democratic. The local association consisted of a number of growers contiguously situated, who united for the purpose of preparing their fruit for market on a co-operative basis. They established their own brands and made their own rules as to the grading, packing, and pooling of their fruit. Usually these associations owned thoroughly-equipped packing houses; every grower's fruit was separated into different grades according to quality and placed in the common pool. Later, each grower received his percentage of the returns according to grade.

The theory upon which the exchange worked was, that every grower is entitled to furnish his *pro rata* of the fruit shipped through his associations and every association to its *pro rata* of the various markets of the country. This theory, reduced to practice, gives every grower his fair share, and the average price of all markets.

PRESENT METHODS OF PREPARING ORANGES FOR MARKET.

It is recognised that good-quality fruit and regular supplies are necessary in the stabilisation of a marketing scheme. Due attention therefore is given, in many cases under the direction of the associations, to the cultivating, fertilising, irrigating, pruning, and fumigating of orchards; and varieties of trees have been selected with a view to securing a year-round supply.

The two principal varieties of oranges now grown are the "Navel," which matures in the winter months, from December to May, and the "Valencia," which matures in the warmer weather, from May to December. Ninety per cent. of the oranges grown in California are of these varieties.

Field Operations.

The picking is done in many cases by picking crews directed by the local packing associations. Oranges and lemons are not picked or pulled from the trees, but are carefully clipped from the branches with specially designed clippers. The stem is clipped close to the fruit, so that no stem end is left to puncture or scratch other fruit when packed. The orange is carefully removed from the tree to avoid its being scratched on the limbs of the tree, and is carefully placed in a picking sack to prevent its being bruised. Bruises and skin punctures allow decay spores to enter, and thereafter spoilage quickly follows. Ordinarily, oranges and lemons will not decay quickly unless the skin has been injured, and consequently the fruit is handled from the time it is cut from the tree almost as carefully as eggs are handled.

When the picker's sack is filled, the fruit is placed in field boxes by lowering the sack into the box, unfastening a flap at the bottom of the sack, and then carefully lifting the sack from around the fruit. Each picker also places a tag or a mark of some kind in each box filled by him, and faulty handling can easily be traced. The fruit is then carted to the packing shed in trucks covered with tarpaulin to protect the fruit from the sun, and several boxes from each load delivered are inspected to ascertain the care which is being shown in the picking of the fruit.

Packing and Grading.

The work of the packing-house begins with the cleansing of the fruit; this is generally done by passing it through huge washing machines equipped with swiftly revolving soft brushes and using clean warm water. Next, the fruit is conveyed by mechanical means from the bath through the dryer, where it is exposed to a heavy blast of air, which thoroughly dries it before it is landed on the grading table.

At the grading table every orange is examined by experts, and carefully placed in the grade to which it belongs. The graders stand before a long belt, on which the fruit is carried, and pick out the various grades and place them on conveyors to be automatically sized according to diameter, and carried to the proper bins for wrapping and packing.

Packers, wearing soft white gloves to prevent injuring the skin of the fruit, carefully wrap the fruit and place it in boxes for market. In order that carelessness may be corrected, each packer places a ticket in each box packed. Oranges are packed in different sizes, each size being placed in the box in a certain geometrical arrangement, and each box containing a specified number of oranges (varying according to size). A box of "Sunkist 126," for example, would contain 126 oranges of best quality and appearance and of uniform size.

The standard grades are fixed by representatives of the growers, packing associations, and distributors, and it is claimed that the regular supply of uniformly graded fruit has given general satisfaction to the consumer, the selling agent, and the grower. The C.F.G.E., which supervises most of the marketing operations of oranges, lemons, and grape fruit in California, pays special attention to the marketing of the "Sunkist" brand, and employs its own inspectors to ensure that fruit packed under that label is up to standard. The attached particulars in regard to grade specifications, kindly supplied by the Exchange, may be of interest to the citrus growers of Queensland.

MARKETING ORGANISATION.

THE LOCAL ASSOCIATION.

In California the individual packing shed is a thing of the past. The association sheds are controlled by a directorate elected by the growers, and a manager experienced in the handling and selling of fruit is appointed. The growers who are members of the association are required to sign contracts, and are not permitted to interfere with the management of the sheds. These contracts provide that the grower shall pick, haul, and deliver to the packing shed of the association, and at such times and in such quantities as the association or its agent may direct, all the citrus fruit grown upon his land during the term of the agreement. The association agrees to receive, pack, sell, and market all the fruit whenever a market can be found, and to pay to each of the growers the amount received for his fruit less the charges for packing, transport, and selling.

THE DISTRICT EXCHANGE.

Next to the Local Association (or Exchange) comes the District Exchange, which is also run on a no-profit basis. These District Exchanges act as clearing houses in marketing the fruit for the Local Associations, and act as the media through which most of the business between the Local Associations and the Central Exchange (referred to later) is performed. The District Exchange orders cars and sees that they are sent to the various association loading places; keeps a record of the cars shipped by each association and of their destination; receives information from the Central Exchange on all phases of marketing, and places that information before the Local Associations; receives the proceeds for the sale of the fruit, and apportions such proceeds to the associations concerned. Each of the Local Associations enters into a contract with the District Exchange to the effect that it will market through the District Exchange the whole of the fruit produced by its members, and that the District Exchange may retain brokerage to cover the expenses incurred. The agreement further provides that the District Exchange shall do its best, as the agent of the associations, to sell and dispose of the fruit; but it accepts no responsibility or financial liability other than receiving the proceeds and apportioning them equitably after deducting brokerage for expenses. Associations which fail to deliver fruit controlled by them loaded on cars at the loading stations are charged 25 cents per box as damages.

THE CENTRAL EXCHANGE.

Powers and Functions.

After the District Exchange comes the Central Exchange, which is really a central executive, whose duty it is to furnish marketing facilities to the District Exchanges at a *pro rata* share of the cost. Each District Exchange enters into an agreement with the Central Exchange to the effect that it will ship all fruit of which it has control through the agencies established by the Central Exchange, and will consign all shipments through and by the Local Exchanges to some point at which the Central Exchange has representation. The agreement further provides that, if a District Exchange fails to ship all its citrus fruits as provided, or disposes of all or any of it elsewhere or otherwise than is provided, such District Exchange shall pay as liquidated damages to the Central Exchange a sum of 25 cents per box on all fruits disposed of in a manner contrary to the agreement.

The Central Exchange places bonded agents in the principal markets; it gathers full information of the conditions in each market; receives telegraphic advices of the sale of each car of fruit, and furnishes the information every day to the associations; it takes care of litigation that may arise in connection with marketing, and handles all claims; it conducts an extensive advertising campaign to popularise fruit and develop new markets.

With the information then at its disposal, each shipping agency may regulate its shipments, develop its own brands, use its own judgment as to when and in what quantities and to what markets the fruit shall be shipped, and the price it is willing to accept. There is no uniformity in price for different brands—every brand sells on its own merits. The agent in the market acts directly under the orders of the shipper; the Central Exchange does not interfere, but is the medium through which orders for fruit pass from the agent to the shipper. It furnishes such associations daily with information regarding general movements of cars, general conditions of markets at different places, the prices at which all Exchange fruit is sold, and such other information as will enable growers and shippers, through their associations and District Exchanges, to decide the questions of distribution for themselves.

The Exchange never contemplated the opening of wholesale or retail houses, but to put the fruit into the hands of legitimate dealers first hand. It established a system of agencies in all the principal cities of the country, employing capable and experienced agents. Most of these agents are salaried officers, and have no other business to engage their attention. They sell the fruit to smaller cities within their districts.

Over all these agencies are travelling agents, who have authority to supervise and check the work of the various agencies. These general agents maintain a bureau of information through which all agents receive every day detailed information as to sales of Exchange fruit in other markets on the previous day. This information enables the agents to fix prices, and if an agent is unable to sell at the average prices prevailing elsewhere, he promptly advises the head office, and sufficient fruit is diverted to other markets to restore normal prices. Approximately 40 per cent. of the fruit is sold by public auction, and the remainder privately at prevailing market rates. Through the agents the Exchange receives and transmits to its members trustworthy information regarding market conditions, visible supplies, &c.

Results of Combination.

The trade found it much more satisfactory to deal with a central body with representatives on the ground than to negotiate with individual shippers hundreds of miles away. The wholesale and retail merchant found that the fruit was more uniformly graded, more attractively packed, kept better, and was easier to sell; and that supplies came forward more regularly. To-day the Exchange has 10,500 growers, 200 packing associations, 20 District Exchanges, and 77 sales offices. From these sales offices the fruit is distributed to 2,500 wholesalers and 400,000 retailers.

To sum up the advantages of co-operative marketing, it is claimed that the packing and selling costs have been reduced by one-third, transportation charges have been reduced by 10 per cent., Customs duties on imported fruits have been put on a fair basis, the present-day large crop is successfully marketed, whereas thirty years ago a comparatively smaller crop was regarded as an over-supply, and consumers get better fruit at a lower price than ever before.

ACTIVITIES INCIDENTAL.

In addition to the sales staff, the Exchange has several other departments or branches which concentrate on special matters relating to its business. Some of the more important of these departments are—

The Advertising Department.

The public is particularly attentive now to sound information regarding diet and nutrition generally. Wide publication of facts regarding malnutrition or undernourishment of city children, due to deficiencies in diet, has focussed public attention on the relation of proper diet to health. Government agencies, teachers, and the medical profession are united in urging a greater use of fruit and vegetables. Last year coloured pages in leading national magazines, especially magazines appealing to the housewife, were the principal means of advertising the merits of citrus fruits. A feature which has also been developed is the sending to newspapers and magazines of interesting news material in connection with the industry. New recipes, facts on nutrition, current news of the industry, history of the Exchange, articles on selling, fruit displays, and stock turnover are typical subjects. Over 145,000 persons wrote requesting the Sunkist recipe-book and other booklets, which are distributed at cost.

Dealer Service.

Experienced men call on retail merchants, show them the importance of good displays, arrange special sales of fruit, distribute display material, and explain the wisdom of reasonable margins and quick turnover. Every practical sales idea and every successful display method gathered from several years' experience in working with the retail trade in all sections of the country are disseminated by these men, who are practically a clearing-house for practical ideas and methods. These men last year visited 12,000 retailers, and personally decorated 8,000 stores. Personal work is supplemented by a mail service, circulars and individual letters being used to interest the trade in the dealer service and to broadcast successful sales plans and ideas.

Fresh Fruit Drinks.

Last year the Exchange manufactured and sold to soda fountains 5,000 Sunkist fruit-juice extractors, thus introducing for the first time in a large way the service of fresh fruit drinks at the fountains. Hitherto the fountains generally have offered their

customers orange and lemon drink substitutes made synthetically or from preserved concentrates, and the development of this field for marketing fresh fruit has awaited the perfection of a practical device for extracting fruit juice. A wide distribution of the new machine, together with proper advertising, will now create a new outlet for large quantities of citrus fruits.

Traffic and Claims.

This branch has secured material reductions in rail freights on car-loads of fruit and on orchard-heaters railed from factories in the East. Claims for overcharge and loss and damage in transit amounting to 300,000 dollars were collected last year. The shortage of refrigerator cars is also receiving attention.

Law.

Keeps informed on and reports to the Directors important developments and trends in legislative matters pertaining to the co-operative movement and to agriculture in general. In addition to public policy questions affecting the organisation, members are kept fully informed regarding laws governing taxation in the various States and their interpretation by the Courts, trade mark infringements, welfare of employees, and employers' liability. Consideration is constantly given to Local Association questions of organisation and finance as well as to individual problems arising in the conduct of their affairs.

Field Department.

There is a well-organised Field Department experienced in the enforcement of regulations governing advertised brands. The organisation has clearly recognised its responsibility to the trade and the public, as well as to the growers, of fully maintaining the quality of its advertised brand, consequently that brand has never stood higher, nor has the confidence placed in fruit of that brand by the trade and the consumers been more merited. In addition to inspection work, the Field Department actively assists shippers in all problems relating to the handling of fruit and in making known to growers the advantages of co-operative marketing as conducted by the Exchange.

Pest Control Bureau.

In co-operation with the local, State, and national agencies, the Pest Control Bureau assists growers in adopting the most practical and effective control measures, and stimulates the development of better control generally. The Bureau also concerns itself with the enforcement of strict quarantine and other preventive measures against the ever-present danger of pests being introduced into the citrus districts.

Exchange Research Laboratory.

Investigates problems of a chemical nature connected with the citrus industry, and assists the by-product companies formed by Exchange growers in developing a profitable outlet for the increasing quantities of fruit not suitable for sale as fresh fruit.

Lemon Products Company.

Last year the company produced 12,000 lb. of lemon oil and 600,000 lb. of citric acid, the whole of which was sold. The capital of the company is 250,000 dollars, and the tangible assets 280,000 dollars. Since its organisation in 1915 the company has purchased from shippers cull lemons to the value of 400,000 dollars.

Orange Products Company.

The company operated by members to develop methods for the utilisation of oranges not suitable for shipment. A successful process has been put into operation for the recovery of oil of orange; very encouraging results have been attained in the manufacture of concentrated orange juice; and attention is being given to the manufacture of other products. During the two years of its existence the company has processed fruit at the rate of 1,200 tons per month, and this year it will be able to return to growers a creditable amount for a large volume of fruit which on account of damage by frost would otherwise have been practically useless.

Packing-house and Orchard Supplies Company.

A Fruit Growers' Supply Company has been organised to secure packing-house and orchard supplies. The authorised capital of the supply company is 6,000,000 dollars, of which over 4,000,000 has been paid in, and the remainder is being gradually collected from the growers at the rate of 2 cents (1d.) per box on their shipments through the Exchange. The company has two lumber plants to cut timber on the land purchased from the Government, and it is in a position, if need arise, to furnish the full requirements of growers for boxes from its own mills. In its purchases of the principal materials for use in the industry, it is directly in touch with the sources of supply, and with its large volume of purchases is in a position to secure such supplies for the growers at the lowest possible prices.

APPLICATION TO QUEENSLAND.

Some of the outstanding features of the Californian Fruit Growers' Exchange which are quite capable of adaptation to Queensland conditions are—

(1) The employment of salaried agents to concentrate on the marketing problems in various cities; to collect data as to supply and demand; to telegraph particulars as to prices obtained for Exchange fruit; and to do all in their power to extend the markets in their particular centres.

(2) The organisation of local packing associations for the grading and packing of fruit for market, and of district associations to act as the forwarding agents.

(3) The systematic attempt to provide for the orderly shipment of fruit to markets in sufficient quantities to meet the demand but not sufficient to cause over-supply.

(4) The formation of companies or trading societies for the treatment of fruits not up to standard grade, and of expert departments or branches to deal with special problems such as legal matters, claims, research, &c.

(5) The systematic advertising of standard products and other propaganda for encouraging the use of fruit in greater quantities.

SUGGESTIONS.

In its programme for 1923-24 the Council of Agriculture should be mainly concerned in the solution of problems connected with the harvesting, grading, packing, storage, transport, and marketing of produce; and in the arrangements for obtaining, at satisfactory prices, supplies required by producers. To enable the Queensland Producers' Association to carry out the functions as outlined it is suggested that—

(1) Its objects as defined in the Primary Producers' Organisation Act should be extended to include power to trade or to make arrangements with trading concerns for the conduct of its business.

(2) The Primary Products Pools Act should be amended to permit the Council, for co-ordination purposes, to have the right to nominate one member of each commodity board appointed under that Act.

Power to Trade.

The power to trade would not necessarily result in the establishment of a big trading concern controlled directly by the Council. It should be open to the Council to make arrangements with existing traders, firms, or companies for the conduct of its business, and it should be possible for the Council to co-ordinate the activities of existing farmers' co-operative companies or societies. The general scheme might be as follows:—

(1) The Council to act as a central administration directly controlling general matters such as organising, collection and distribution of data, and general supervision of marketing.

(2) Where existing farmers' trading societies can be amalgamated or improved upon under co-ordinated methods, the Council to try to effect such improvements and to secure representation on the directorates of such societies.

(3) Where satisfactory arrangements cannot be made with existing farmers' trading societies or other traders the Council to organise sectional trading societies to facilitate the harvesting, packing and grading, storage, transport, and marketing of products; the Council to be represented on the directorates of these trading societies for the purpose of co-ordinating effort.

The societies to adopt rules approved by the Council, and to register under "*The Industrial Provident Societies Act of* 1920" if considered practicable.

(*Note.*—"*The Industrial Provident Societies Act of* 1920" permits of registration of any trading society whose capital is restricted to £100 per member; and upon registration the society may engage in any trade operations permitted by its rules. In the interest of members the Registrar examines these rules prior to registration to ensure that proper safeguards have been made.)

(4) The District Councils and Local Producers' Associations and District Agents to act as media through which the Council obtains data as to production, organises the societies mentioned, and supplies information to growers.

Under such a scheme there may come into operation—

(*a*) A number of societies for the purpose of co-operative handling of products and preparing them for markets. Such societies might include—

Local or district co-operative grading and packing and storage sheds.
Local or district societies for conservation of fodder.
Local or district herd testing societies.
Local or district societies for joint purchase of high-power machines, harvesters, cultivators, transport wagons, tractors, pure bred sires, &c.

(*b*) An organised system of collecting and distributing market information to enable such societies to ship to the best markets and in such quantities as will facilitate the sale of the produce.

Marketing of Fruit.

It is suggested that the Council of Agriculture should forthwith try to organise the marketing of fruit, and that the following scheme in regard to procedure to be adopted should be extended to other commodities so far as that procedure can be applied:—

(1) That in connection with the marketing of fruit the Council of Agriculture take steps forthwith to extend as far as possible the existing local markets and to discover new markets within the State.

(2) That for the purposes of (1) each District Agent be required to act as a markets officer for his district and to keep the Council advised as far as possible of stocks in sight, ruling market prices, movement of products, markets over-supplied or under-supplied, &c.

(3) That subagents be appointed, on terms to be arranged by the Council, to assist the District Agent in collecting the data. For example, in the Rockhampton district the District Agent would be responsible for the town of Rockhampton, but he might have a subagent at Mount Morgan, one at Gladstone, and one in such other centres as may be arranged, to collect for him (for transmission to the Council through him) the data at such subcentres.

(4) That on receipt of such data the Council cause it to be tabulated and supplied forthwith to the recognised co-operative associations which are working in conjunction with the Council.

(5) That on receipt of the particulars furnished by the Council these associations arrange for the necessary supplies to be forwarded through their agencies to the centres concerned.

(6) That to ensure that good fruit shall be forwarded and that satisfactory markets may be established and maintained standard grades and packs be determined.

(7) That the standards be determined by a duly appointed conference consisting of representatives of the Department of Agriculture, Council of Agriculture, the recoginsed societies, the producers, and the trade.

(8) That if produce of a standard inferior to the prescribed standard be forwarded by a producer, such producer be warned that he will be debarred from participating further in this scheme of distribution.

(9) That centres be encouraged to pool their produce and to try to establish a recognised brand for that centre, which will become known in the markets of the State by its uniformly good quality.

(10) That for the purposes of this scheme District Councils, District Agents, and Local Producers' Associations in so far as they are concerned be urged to organise their districts.

(11) That an organised scheme of advertising and sales methods be instituted to encourage the trade and the consumers to buy standard grades of fruit.

(12) That in due course the Australian markets be organised by the Council of Agriculture in similar manner.

(13) That, should it be found in due course that the Queensland and Australian markets are unable to absorb the whole of the produce, steps be taken by the Council to find outside markets.

(14) That the best possible provision be made with the help of the Agricultural Department and the Queensland University for the treatment and utilisation of inferior grades of fruit.

(15) That upon the finding of any commercial process or treatment for such fruits co-operative societies be formed for the handling of the work.

(16) That the question of establishing co-operative societies or a central co-operative society for the purchase of orchard or packing requirements be fully considered.

[The proposals for the extension of powers of the Council and the suggestions for the marketing of fruit have already been referred to the Council of Agriculture and adopted.—ED.]

GRADE SPECIFICATIONS.

ORANGES.

Following are the grade specifications of the California Fruit Growers' Exchange referred to in the foregoing article:—

Sunkist.

Mature oranges of one variety; of good eating quality; well-grown specimens of normal form, picked from the tree; of good colour for the variety; of good texture; excluding rough, coarse, more than slightly puffed, more than slightly scarred, more than slightly sunburned, or misshapen fruit, or dirty fruit, making it uninviting in appearance to the consumer; substantially free from scale, other insect or fungus diseases, splits, or defects of any kind that cause fruit to decay; excluding fruit showing effects of frost or which cuts dry for any other reason. Oranges packed under the Sunkist brand shall not vary more than 10 per centum below the foregoing specifications, except as provided in the special rule relating to frosted or dry fruit.

Red Ball Oranges.

Mature oranges of one variety; of good eating quality; well-grown specimens of fair form, picked from the tree; of fair colour for the variety; of fair texture; excluding badly sunburned, very rough, very coarse, badly puffed, badly scarred fruit or fruit so scaly as to make it uninviting in appearance to the consumer; substantially free from other insect or fungus diseases, splits or defects of any kind that cause fruit to decay; excluding fruit showing effects of frost or which cuts dry for any other reason. Oranges packed under this grade shall not vary more than 5 per centum below foregoing specifications.

LEMONS.

Sunkist.

Lemons, well-grown specimens of normal form; excluding fruit with abnormally long necks; of good uniform colour; excluding fruit more than slightly sunburned or more than slightly green in colour; of good texture; excluding rough, coarse fruit, and fruit with deep dark scars, or dirty fruit, making it uninviting to the consumer; substantially free from scale, other insect or fungus diseases or defects of any kind that cause fruit to decay; excluding spongy, hollow centre fruit and fruit affected with interior decline, blossom end decay, or fruit showing effects of frost or which cuts dry for any other reason. Lemons packed under the Sunkist brand shall not vary more than 10 per centum below foregoing specifications, except as provided in the special rule relating to frosted and dry fruit.

Certified Choice.

Lemons, well-grown specimens of fair form, of fairly uniform colour; excluding fruit badly sunburned or very green in colour; of fair texture; excluding very rough, very coarse, badly scarred, dirty fuit, fruit so scaly as to make it uninviting in appearance to the consumer substantially free from other insect or fungus diseases or defects of any kind that cause fruit to decay, excluding very spongy or badly hollow-centre fruit and fruit affected with interior decline, blossom end decay, or fruit showing effects of frost, or which for any other reason cuts dry. Lemons packed under this grade shall not vary more than 5 per centum below foregoing specifications.

Special Rule Relating to Frosted and Dry Fruit.

No oranges, lemons, or grapefruit shall be shipped under the Sunkist brand or the Certified Choice brands, if the shipment contains fruit, in excess of 5 per cent., showing effects of frost, or which cuts dry for any other reason.

Special Rule Relating to Wrapping.

All oranges, lemons, and grapefruit, with the exception of tangerines and mandarins, packed under the Sunkist brand must be wrapped in paper wraps on which is printed the Sunkist brand design or trade mark. Oranges, 252's and smaller, may be packed under the Sunkist brand without wrapping.

Special Rule Relating to Maturity of Navels and Valencias.

Navel and Valencia oranges shall be considered immature if the juice does not contain soluble solids equal to or in excess of eight parts to every part of acid contained in the juice, the acidity of the juice to be calculated as citric acid without water of crystallisation.

Special Rule Relating to Compliance with Federal and State Laws.

No fruit, oranges, lemons, or grapefruit, will be handled by the C.F.G.E. under any brand or grade, or at all, unless the same shall in all respects conform to the laws of the State of California, and, if the sale is made in interstate commerce, to Federal laws, and to the laws of the place where the fruit is sold. The Field Department shall inspect all grades of citrus fruit shipped through the C.F.G.E., and shall in every way endeavour to make uniform the enforcement of the laws concerning the shipment of California citrus fruit.

Enforcement of Grade Specifications.

The enforcement of the grade specifications is lodged with the Field Department of the C.F.G.E. The Field Department shall determine whether the fruit being packed for shipment complies with the grade specifications, and, furthermore, shall be charged with the authority to compel repacking of the fruit in case it is not up to grade specifications.

If any member of the Field Department finds fruit that, in his opinion, is below the specifications adopted, he shall immediately take the matter up with the shipper or the manager of the Association. If they cannot agree, then the manager of the District Exchange and the supervising inspector shall be called into consultation. In case these cannot agree, the manager of the Field Department shall be called in and his decision shall be final. It is understood, of course, that if any shipper feels that the manager of the Field Department has erred in his judgment, he may properly bring the matter before the management of the C.F.G.E.

Method of Listing Certified Choice Brands.

Each association wishing to abide by the specifications formulated for choice grade shall designate the brand or brands under which it will ship fruit that conforms to the specifications governing choice, and which will be subject to grade inspection by the Field Department. A list of certified choice brands will be forwarded to all district managers, who will be advised that these brands are being packed in accordance with the choice grade specifications, and are subject to grade inspection by the Field Department.

Penalties for Violating Sunkist Grade Specifications.

It is the policy of the C.F.G.E., as the owner of the trade mark "Sunkist," that in case of the persistent misgrading of fruit for shipment under this brand that the Exchange will not distribute any fruit of such association under such trade mark, and all shippers, division managers, district managers, and the advertising department shall be notified to such effect.

Penalties for Violating Choice Grade Specifications.

It shall be the policy of the C.F.G.E., in case of the persistent misgrading of fruit under the specifications governing choice, to withdraw the shipper's brand from the certified list, and all shippers, division and district managers shall be notified to such effect.

THE FUTURE OF THE SUGAR INDUSTRY.

QUEENSLAND DELEGATION IN MELBOURNE.

On Friday, 2nd March, representatives of the Queensland Sugar Industry, appointed as a delegation from the recent Sugar Conference in Brisbane, met the Prime Minister, Hon. S. M. Bruce, M.C., in Melbourne, and discussed with him urgent matters affecting the future of the Sugar Industry. The Minister for Agriculture and Stock, Hon. W. N. Gillies, led the delegation, and pressed for a renewal of the existing agreement under which the industry has become substantially stabilised. Points in favour of renewing the agreement or adopting the submitted tariff alternative were stressed strongly by members of the delegation, who represented every section of the sugar industry.

The Prime Minister, in the course of his reply, stated that the Federal Government realised fully the value of the industry both nationally and economically; he held out no hope for the renewal of the agreement, but promised that the industry would be safeguarded fiscally. The proceedings in Melbourne are reported fully hereunder.—Ed.

A delegation from the Sugar Conference held in Brisbane recently, and representing the various sugar interests of the Commonwealth, waited on the Prime Minister, Hon. S. M. Bruce, M.C., at Melbourne, on Friday, 2nd March. The delegation was introduced by Senator T. Givens (Q.).

ADDRESS BY MR. W. N. GILLIES.

Hon. W. N. Gillies, Minister for Agriculture in Queensland, was the first speaker. He said: The gentlemen now before you have been appointed as a delegation from a Conference called by the Queensland Government representative of the sugar industry of Queensland, and with them are two representatives of the industry in New South Wales.

My Government was keenly disappointed when the Federal Parliament dissolved without dealing with our request for a renewal of the Sugar Purchase Agreement. The small increase in the tariff we could not regard as a satisfactory alternative. The Conference referred to was called immediately after the Federal elections, and, as you are aware, no time has been lost in pressing for this interview, the object being to place our case in your hands before your Government formulates a sugar policy. As you had agreed to receive this deputation, we were disappointed keenly to hear your statement in Parliament yesterday against a renewal of the Sugar Purchase Agreement, because our mission is to urge upon your Government the consideration of the following resolution:—

> "That in view of the fact that the effect of the current Sugar Agreement has been to substantially assist to stabilise the industry, and having regard also to the very great importance which the industry is economically, industrially, and nationally to the Commonwealth as a whole, and to the States of Queensland and New South Wales in particular, this Conference strongly urges upon the Commonwealth and State Governments the urgent necessity of renewing the Agreement, at the same price, for a period of five years."

That is, we undertake to continue to supply the Commonwealth for a further five years, with 94 net titre sugar, as hitherto, at 3¼d. per lb.

We are fully aware of the hostility of certain powerful newspapers in the South, who, through ignorance of the facts or because of their failure to outgrow opinions formed or policies advocated in pre-Federal days, oppose bitterly a continuance of the present Sugar Agreement.

National Security Ensured by Sugar.

To me it was not a matter of wonder in pre-Federal days that people in the South, who believed in the ideal of White Australia and knew the history of America, should regard the Queensland Sugar Industry, with its kanaka labour and large plantations, as something of a menace; but it is surprising that there are Australians to-day who do not realise that White Australia has passed from an ideal to an actuality through the agency of the sugar industry, that both the kanaka and the large plantations have long since disappeared, and that in their stead are small farms owned and worked almost exclusively by men of their own colour, race, and ideals; and this industry to-day, far from becoming a menace, has become the greatest bulwark of our national safety.

Australia is the one country in the world to-day that grows sugar-cane successfully and manufactures it into sugar by white labour and under white labour conditions, while the sugar industry is the only industry suitable for our thousand miles of tropical coastal lands, the most vulnerable part of Australia.

What the Federal Royal Commission on Sugar Said.

The Royal Commission appointed by the Federal Government in 1911 did the sugar industry and Australia a great service by presenting to the public many important truths. Had that report been carefully studied, even by newspaper men and politicians, the present hostility would not now exist.

The Commission said, and we wish to emphasise those views to-day:—

> "Unsettled areas in the tropical parts of Australia are not only a source of strategic weakness; they constitute a positive temptation to Asiatic invasion. The ultimate, and, in our opinion, the effective justification of the protection of the sugar industry lies beyond the question of industry or wealth production. It must be sought in the very existence of Australia as a nation."

The Sugar Industry and National Defence.

We say emphatically that in the defence of this Continent and the maintenance of White Australia, the preservation and advancement of the Queensland Sugar Industry are involved. We believe that the industry can only be maintained and extended so as to provide all the sugar Australia requires, by one or other of the methods now advocated.

According to Press reports a few days ago, you were speaking on defence and the importance of the Navy. Battleships are necessary; but is not a girdle of white settlers round Australia, producing an important article of diet, equally valuable? The new sugar-mill, costing half a million, about to be erected by the Queensland Government to open up the jungle lands of the Tully River is as good an investment for defence as a modern battleship, for it will settle men there who will be ready to fight if needed. I am right in saying that the first Contingent to leave the mainland during the late war was despatched from Townsville, North Queensland, going to Papua and Thursday Island.

The Queensland Government has invested in mills one and a-quarter million sterling. We are spending two millions in completing the North Coast Railway, which, with the settlement that the sugar industry alone can maintain, will be of great value in case of a threatened invasion; but, of course, such railways without the settlers would be an advantage to the invader.

Australia Should be Self-contained.

Our second great claim for your consideration is that Australia should be self-contained. We can, and should, produce all we require, not only for the present population of five and a-half millions, but for a population of fifty millions.

The Queensland Government and the Industry—Beneficial Effects of Stabilisation.

I have mentioned that the Queensland Government has large sums invested in sugar-mills and railways in sugar districts. Notwithstanding this, our greatest concern is for the grower and the worker in the tropics. We have passed legislation to encourage and protect those two sections in so far as State legislation can do that. Neither the need for this legislation nor the history of the early hardships of those engaged in canegrowing need be gone into now; but I want to say that, generally speaking, prior to the present system of control the grower did not receive

a price for his cane which enabled him to pay decent wages, live and keep his family in a moderate degree of comfort, and at the same time return to the soil in the form of manure some of that which he took away from it. Whereas, during the last three years, under the agreement the industry has been stabilised, the grower has received a price for his labour which encouraged him to clear and plant further areas, and to manure and better cultivate existing fields. The increased area in 1921 was 40,000 acres, and at the same time the manufacturer was enabled to install much-needed new machinery to bring his mill to a better state of efficiency, over one million sterling having been expended by the millers during the last three years for this purpose.

For the first time in the history of the industry those engaged in it knew where they stood for at least three years. The term was altogether too short, for it should be realised that felling, burning, and clearing Northern scrub lands is slow and expensive work.

Sugar-cane, unlike many crops, remains in the ground from three to six years, while a modern sugar-mill, with a tramway system complete, costs anything up to half a million sterling.

Room for Expansion in Queensland.

We have hundreds of thousands of acres of land with climate and rainfall suitable for sugar-growing equal to that in any part of the world, and this is a point worth remembering, quite apart from the vital question of keeping our Northern coastal belt peopled from a defence point of view. You will perhaps be surprised to know that during the seasons 1915 to 1920 Australia spent sixteen and three-quarter millions sterling in importing sugar, excluding duty, and that the price for these importations was £9 7s. 6d. per ton higher than that paid to the local producer under the present Agreement.

Stability and Security Ensure the Cheapest and Best.

The immediate advantage to Australia resultant from the present Agreement is that we are now producing in Australia all the sugar that Australia requires. We guarantee to do that if the Agreement is renewed at the reasonable price to the consumer as set out in the resolutions.

It can be shown that, while the present system of control has been advantageous to the producers by giving stability and security to the industry during the period, the Australian consumer received the cheapest and the best sugar in the world.

An Illuminating Comparison.

A comparison of the world's prices, which I furnish herewith, shows that the Australian public, under the present system of control, saved twenty-five millions sterling, as against paying world's parity prices. At the time of entering into the present Agreement to sell our raws at £30 6s. 8d. per ton, Mr. Hughes said that the cost of importing a similar article was over £60 per ton. It was the comparative cheapness of Australian-grown sugar under this system of control which enabled the Australian manufacturers to export articles made from or containing sugar to the value of over seventeen millions sterling.

In the light of these figures, I am not surprised that Sir Henry Jones, in writing to the Australian Sugar Producers' Association, under date 6th April, 1921, should say:—

> "We are not up against the Australian sugar industry. We know quite well that we must pay a price that will enable the sugar to be grown by white labour, and we are quite willing to do this. In so far as the Australian market is concerned, it does not matter to us what we pay for sugar. As regards the export market, we are absolutely in agreement with the motion that was passed at your meeting concerning rebates on imported sugar required for manufacturing purposes and re-exported in manufactured form. An arrangement such as this would, undoubtedly, be of very great assistance to the Australian fruitgrowers. We think efforts should be made to enable the fruitgrowing industry and the sugar industry to be carried on in harmony, each to help the other, and we see no reason why these two great industries should not be carried on side by side—let them live and let live."

The following table (figures compiled from "International Sugar Journal," England) shows the comparative prices in Australia and England:—

	Australia.	England.
1915	£25 ..	£27 to £32 per ton
1916	£29 5s. ..	£34 to £41 per ton
1917	£29 5s. ..	£46 15s. per ton
1918	£29 5s. ..	£57 15s. per ton
1919	£29 5s. ..	£57 15s. to £66 per ton
1920	£49 ..	£66 to £160 per ton

Australian sugar covering all charges.

This delegation agrees with those sentiments entirely. We believe the two industries should work in harmony and, above all, that Australia should be self-supporting.

There are many other important facts concerning both manufacturer and grower that delegates will put before you, but I again emphasise the fact that in the preservation and expansion of the sugar-cane industry of Queensland lies the maintenance of White Australia, and, as already stated, to a very great extent, the defence of Australia.

"We say emphatically that in the defence of this Continent and the maintenance of White Australia the preservation and advancement of the Queensland Sugar Industry are involved. We believe that the industry can only be maintained and extended so as to provide all the sugar Australia requires by one or other of the methods now advocated.

"According to Press reports, a few days ago you were speaking on defence and the importance of the Navy. Battleships are necessary, but is not a girdle of white settlers round Australia . . . . equally valuable?

"The new sugar-mill, costing half-a-millon, about to be erected by the Queensland Government to open up the jungle lands of the Tully River, is as good an investment for defence as a modern battleship, for it will settle men there who will be ready to fight if needed.

"I am right in saying that the first Contingent to leave the mainland in the late war was despatched from Townsville."—*Hon. W. N. Gillies to the Prime Minister (Hon. S. M. Bruce, M.C.), in the course of his (Mr. Gillies') advocacy of Commonwealth consideration for the Sugar Industry at Melbourne, on 2nd March.*

Unity of All Sections.

I am aware that there are differences of opinion regarding the policy of Government or State control of industry, but the delegation before you is made up of all shades of political thought, and it is at one on this question as far as the sugar industry is concerned. Several members of your Government have said time and again that the circumstances of the sugar industry are such that this form of Government control is absolutely necessary.

In conclusion, I desire to respectfully press for an early consideration of the whole question, for the present Agreement is to all intents and purposes at an end so far as the producers are concerned. The crushing season will start very soon, and there is a general feeling of uncertainty in the minds of those engaged in the industry as to their future.

Unacceptable Proposal—Risk of Fiscal Failure.

With regard to your statement that a special tribunal for the sugar industry would be appointed to determine rates of duty, and setting out other conditions, I can assure you that such proposals are not acceptable to the delegates, nor to a

single Queensland member of the Federal Parliament, for all those who are familiar with the ramifications of the industry know that to simply erect a tariff wall is not to give protection to either producer or consumer. If your statement yesterday is your final word *re* the Agreement—and I hope it is not—then let me urge on you the favourable consideration of the alternative scheme set out in the attached resolutions.

An Alternative Scheme.

This scheme, while guaranteeing the consumer 1A refined sugar at 4¾d. per lb., relieves the Commonwealth Government of any financial obligation. The delegates, whilst anxious to return, are prepared to remain in Melbourne whatever time is necessary to suit your convenience.

THE SUGAR PRODUCERS' VIEWPOINT.

The Merits of the Agreement and Its Justification.

Mr. G. H. Pritchard, Secretary of the Australian Sugar Producers' Association, said that Mr. Gillies had stated the foundation of their case, especially directing his remarks to the national importance of the industry, and with reference to the resolutions carried in Brisbane, the speaker proposed to deal with these remarks seriatum. He would endeavour to show the merits of the Agreement and to establish a complete justification for it. There were two cardinal points to be kept in view, first to stablise the industry, and secondly to stimulate production. This had been the original idea when the Agreement was brought before the present Prime Minister's predecessor, and he was glad to be able to say to-day that both of these desirable objectives had been conspicuously achieved. He desired to point out, however, that the circumstances obtaining in regard to the Sugar Agreement were somewhat different to those obtaining in regard to any other thing. In the first place they had the Sugar Acquisition Act under which the Queensland Government acquired the whole of the sugar produced in the State. Secondly, they had the Regulation of Sugar Cane Prices Act which fixed the price of cane. They had the Industrial Arbitration Act and the Industrial Arbitration Court under which is fixed matters relating to labour, and the conditions under which the workers perform. There was also the Workers' Accommodation Act. It was quite realised that some of the industries had some of these component governing statutes, but he did not know any one which had them all. It seemed to him, therefore, that so long as those statutes existed the raw sugar miller should know where he stood.

How the Consumers are Protected Under the Existing Agreement.

He also wished to point out that Government intervention was initiated to protect the consumer. In 1920, they sold their sugar to the Commonwealth for £49 a ton, while the price in Cuba two months later in the same year was £137 10s. As a further evidence of the good bargain this was to the consumers of Australia the Customs records would show that in 1920, 100,000 tons of sugar were imported, which cost the Commonwealth £60 a ton, and in 1921, 84,470 tons which cost £36 15s. 8d., without duty—because after the Agreement was made he understood the Government suspended the charging of duty—therefore he thought that with these figures standing out like a beacon light it could not be contested that when the Prime Minister made this Agreement he did an eminently good thing for the consumers of Australia, and he really did not think that there could be a more emphatic endorsement of the foresight and wisdom of Mr. Hughes in making this Agreement than this.

The Voluntary Sugar Pool Proposal.

Regarding the resolutions at the Brisbane Conference, the first proposal was that a sugar pool be established for a period of five years—a voluntary pool and not a compulsory one. As the Commonwealth Government had done much to assist other industries by way of pools, it seemed only reasonable to assume it would be favourably disposed to regard any proposal in connection with the sugar industry.

The second resolution was a machinery one only by which the sugar would be acquired—also to make provision to include New South Wales sugar in the pool; and there should be no difficulty in the Colonial Sugar Refining Company bringing in the product of their three mills. Resolutions Nos. 3 and 4 were the ones which concerned the Commonwealth directly.

No. 3.—While the pool is in operation, the Commonwealth Government to prohibit the importation of black-grown sugar except so much as is required from time to time as determined by the pool to make good any Australian shortage; this embargo to be applied subject to conditions stated in Clause 4 relating to price to be charged to the consumers.

No. 4.—During the currency of the pool 1A refined sugar to be sold at such a price as will ensure that the retail price of refined sugar to the consumer shall not exceed 4¾d. per lb. in capital cities.

Continuance of Tariff Protection.—Safeguarding Consumers.

They were asking for a continuation of the existing embargo against the importation of black-grown sugar, and that produced under black-labour conditions. In exchange for that concession they undertook that 1A refined sugar would be produced so that it could be retailed at a price of not more than 4¾d. per lb. They were prepared to give that safeguard, and it therefore appeared to him that they were putting up a perfectly sound and proper proposition. He would submit that while their undertaking ran concurrently with the embargo the Commonwealth Government ran no risk whatever. If they failed the embargo could be removed. They were producing all the sugar that was required for the consumption of the Commonwealth, and were thus saving the money value of that sugar getting out of the country. The chief overseas source of sugar was Java, and the Commonwealth had very little trade with Java, and consequently any sugar purchased from them meant a trade balance against us. The speaker then went on to refer to the poisonous remarks passed by the Melbourne Press. The interests which he represented, however, were asking for no concession whatever, neither did they desire any financial aid from the Government. They would provide all the necessary machinery. This he considered made a conspicuous difference between the present and many other schemes put forward. He desired to labour this. He did not find anybody else outside Melbourne saying the things that appeared in the Melbourne Press—they were not true.

Queensland's Greatest Agricultural Interest.—An Australian Industry.

In conclusion, Mr. Pritchard emphasised the fact that the sugar industry was one of the greatest possessed by Queensland. Summarising the position he said that it was an Australian industry pure and simple. There never had been a more pronounced national note struck than by the Commission appointed in 1911. The salient features of this were: Burden of the White Australia policy had practically been borne by the sugar people in Queensland; it was the only industry which was successful in the tropical north. It had been pointed out that the wages in the sugar industry were £6,000,000 per annum. The production of sugar had been a great factor in building up industries connected with jams, fruits, milk, &c., the exports of which had amounted to £17,000,000 per annum. Before the war these had been infinitesimal in comparison, and this was because sugar could be supplied to the manufacturers in Australia at a cost which enabled them to compete in the world's markets—in Britain, America, and India, with the Governments of which countries they had contracts. The Sugar Agreement had certainly achieved this purpose. Australia produced all the sugar required for home or export trade. The producer received only 3¼d. for his sugar, which was a very necessary thing to remember. They had been blamed for sugar being 5d. per lb., but the difficulties were not realised, and the price could be easily justified. The value of the Australian output of sugar last year was £9,000,000. If that were taken as an annual income and capitalised at 5 per cent. it would represent the vast sum of £180,000,000, thus illustrating the great benefits to Australia in more ways than one. It was estimated that more than 100,000 persons depended upon the industry, and over 20,000 men were employed. The capital invested amounted to £16,000,000—£6,500,000 for land and improvements, £6,000,000 for machinery, and £3,500,000 for refineries, not including the necessary working capital; he wished to emphasise this fact also. To erect and equip a new mill cost in round figures £500,000; this was a very different thing to a butter factory. There was this difference in particular—*i.e.*, that once you spent such a large sum of money it was there and you could not shift it. If the sugar industry were destroyed it would be so much scrap iron. Further, Australia was the only country where sugar was produced by white labour.

The Domestic Aspect.

Regarding the high price of sugar, the weekly domestic expenditure on sugar was less than any other leading item of food in the family budget. Mr. Piddington, after investigation, had given it that 5½ lb. was necessary for a man and his wife and family of three. Even on the old price that was 2s. 9d. a week; 6d. per week could now be taken off that. He could not but think that a lot of this complaint about the price of sugar was simply passed from mouth to mouth without any serious analysis of what it really meant, and was becoming a sort of catch cry. Mr. Gillies had told them of the immense advantage to Australia through having the sugar industry here that could not be refuted. Between 1915 and 1920 the comparative prices of sugar in Australia and England (from figures taken from the Royal Commission on sugar—"International Sugar Journal") were as under:—

	Australia.	England.
1915	£25 ..	£27 to £32 per ton
1916	£29 5s. ..	£34 to £41 per ton
1917	£29 5s. ..	£46 15s. per ton
1918	£29 5s. ..	£57 15s. per ton
1919	£29 5s. ..	£57 15s. to £66 per ton
1920	£49 ..	£66 to £160 per ton

Australian sugar covering all charges.

Assuming that the Australian consumption was 180,000 tons a year, Australia saved £25,000,000.

Thriving Queensland Towns Supported by Sugar Industry.

There was one other fact, that a number of really important towns depend solely for their existence upon the sugar industry. The speaker remembered Dr. Earle Page having been reported in the paper to have said that during his tour through Queensland that fact had struck him very forcibly. There was Bundaberg and Mackay. The latter had nothing else but the sugar industry and Bundaberg was practically similar. These were two cities typical of many smaller ones.

Home Markets.

There was another feature to which he specially desired to invite attention. Sir Henry Jones had said that he found the Australian market was the very best market for his jams, and he, the speaker, wished to remind them that Queensland, and particularly North Queensland, was one of the finest markets for the goods produced in the Southern States. He had there a leaflet from the Royal Show last September, showing the "Wyreema" working at the wharf discharging cargo from the Southern States and loading sugar to be sent to these States from Queensland.

Immigration and Decentralisation.

The Prime Minister and his colleagues he was sure understood the position and could assist them. It would help solve the immigration problem, and in that way it was a magnificent adjunct in considering the policy of populating this large continent. Queensland stood behind the sugar industry in every shape and form, and he was sure would rejoice if it heard that they had been able to arrange terms satisfactory to the sugar producer.

THE CASE FOR THE CANEGROWERS.

A Pre-Federation Promise.

Mr. T. A. Powell, President of the United Canegrowers' Association, expressed regret that the Government had decided not to renew the Sugar Agreement. He would like to congratulate the Prime Minister upon the published reports of his recent utterances, expressing his sentiments regarding the White Australia policy. He might also remind him of the fact that when the framers of the Constitution asked the people of Queensland to come into the federation it was on the express understanding that Queensland's interests regarding the sugar industry would be protected. Also, it was the vote of the sugar representatives of Queensland that enabled federation to be brought about; he therefore hoped that the people of the Southern States could be relied upon to stand to the contract that was entered into in years gone by.

Holding the North.—National Security.

He further referred to the fact that according to the last census the population of Herbert had increased by 15,000 people, and also that they had thousands and thousands of acres of good land in Queensland that was simply crying out for population. Further, that within a few days' sail there were millions and millions of coloured races merely waiting an opportunity to come along, and that if the people in the South had everything they wanted they should also see that the people in the North received a fair deal. The sugar industry was a unique one—there was only one purchaser. It was not, for instance, the same as the wheatgrower; they had to send their cane to the mill to be crushed and manufactured into sugar. He would like to read an extract taken from the report of the 1912 Commission—

> "The supreme justification for the protection of the sugar industry is the part that the industry has contributed and will, we hope, continue to contribute to the settlement and defence of the Northern parts of the Australian Continent."

A Fair Deal Desired.

When Mr. Hughes was approached in 1920 for the present Agreement, one of the questions had been that if he granted the Agreement could they supply the Commonwealth requirements. They had told him they could, and it was the first time in the existence of the industry that canegrowers had had a fair deal. The land had since then been taken up by settlers. The railway line had just been completed from Rockhampton to Mackay. He had on one occasion seen one of the settlers and his wife carting cane to the railway in a waggonette and buggy. He did not think it fair for any Government to do anything that would injure a class of people like this, as they were the class we wanted in Australia, and they wanted to get on as a white nation. All they asked for was a fair deal. The speaker also referred to the other industries depending on sugar. He hoped the Prime Minister would take this into consideration, also all the other points which had been put to him. They urgently desired early consideration of the question, and a decision as soon as it could possibly be given.

The Financial Risk of Altered Conditions.

Mr. Alexander Innes, Chairman of the Mackay Sugar Producers' Association, said that since 1915 the Queensland sugar crop had been acquired by the Queensland Government and passed on to the Federal Government, who had dealt with it throughout—as regards finance, &c.; that covered a seven years' period. The termination of the Agreement would bring into force again a complete set of new conditions. The financing of the industry was done by the sugar mills, and the extent to which this obtained could be judged from the fact that from the commencement of this year from 25 per cent. to 30 per cent. of the growers had applied for an advance. For the first two months of the year £2,000,000 had been advanced by one institution—this was apart from the sums they had advanced as fixed sums to the mills and other institutions. With these new conditions coming into operation it was necessary for them to know as millers where they stood. On behalf of the millers and growers, he would ask the Prime Minister to give as early a reply as possible. In reply to the Prime Minister, the speaker said that the £2,000,000 referred to was for current crop requirements and for mill requirements, and apart from permanent advances.

The Uniqueness of the Industry and the Question of Tariff Protection.

Mr. W. H. Doherty, Secretary of the United Canegrowers' Association, emphasised one or two points touched upon by previous speakers. In particular that of Mr. Gillies's remarks *re* the uniqueness of the Queensland sugar industry's position as compared to other Australian agricultural industries. He had heard the previous day the Prime Minister in Parliament say that he was prepared to give the industry adequate protection. They could not accept any amount of tariff protection as an adequate protection to the sugar industry, as it was here that the uniqueness of the position became apparent. In other agricultural industries, when, as with the farmer, there were droughts, he obtained the benefit of that rise; in the sugar industry they had no corresponding rise. If during the present year they produced half of the sugar requirements, the price would not be increased for the reason that they had black-grown sugar imported into this country to make up the shortage. That was one of the serious phases of the industry. It was evident that, although production in such an event would decrease, the cost of producing would

be just as great, or possibly greater than if they had an average crop. In a year of under-production, if there was no supervision over the importation of sugar, the temptation was to import sugar as required. If in the following year as much sugar as was required was produced in Australia it would be our sugar and not the imported sugar that would be carried over.

Royal Commission's Report.—Growers' Inadequate Profits.

With regard to some form of supervision, he would read a few remarks by the Royal Commission of 1912 in their report:—

> "Unfortunately, when we come to the growers we find a very different story. While the millers and refiners make handsome profits, the profits of the growers as a class are inadequate. A proportion of the growers as growers do well. The character and situation of the land, the price which was paid for the land, good fortune as regards seasonable rainfall and immunity from pests, floods, or cyclones, the exceptional ability or industry of the grower himself, or the employment by the grower of members of his own family—all or any of these may operate, and have operated, in favour of particular growers to secure good results. But the growers as a class do not, in our opinion, receive their fair share of the profits of the industry as a whole. Nor do they receive that adequate return on their capital outlay which it should be one object of a protective system to ensure. On careful analysis of the evidence submitted by the growers, the large majority were at one in maintaining that an increase in the price of cane was imperative."

That report, of course, was given in 1912, and while it stated there that the millers and refiners had handsome profits, since then the profits had been reasonable and fair, and they wished that condition of affairs to continue.

The Risk of Retrogression.

He also wished to point out that if they had to rely on a duty they would be going back to the condition of things existing at the time that Commission took its evidence. Sugar was then at the lowest price on the world's markets. They did not wish to go back to that condition of things, because it placed the grower in the position that he did not know where he was. The objection to a fixed tariff was that they had a fluctuating price for cane—one year perhaps the price was adequate and next year possibly the price might fall £10 a ton. Their cane had to fall in proportion, and it had been grown by labour that had been fixed at a price when cane was at a decent price. It was not in any way on the same basis as other Australian industries.

The Viewpoint of New South Wales Growers.

Mr. B. McDonough, representing the growers of New South Wales, said that the interests of the northern part of New South Wales were practically identical with those of Queensland, and an agreement entered into by the people of Queensland would be acceptable to those of New South Wales. During the currency of the present Agreement was the only time the growers had enjoyed any form of prosperity. His people would be very disappointed if some assistance were not given by the Government. He also would be disappointed, as at the present time they were spending a lot of money in their district; for this reason they would be glad of early consideration of the matter.

THE PRIME MINISTER'S REPLY.

The Prime Minister, in reply, said that he realised the deputation had come a very long way to see him and to place their views before him as representatives of the Government. In view of that fact, he was following a somewhat unusual course. As Mr. Gillies had pointed out, when a Government had a vote of censure over its head it was generally considered more correct that it should not receive deputations or take any action whatever. In this case, however, he thought perhaps it was only right he should see them and give them an opportunity of placing the position before him as they saw it. There were no members of Parliament present other than the President, who introduced the deputation, but he thought it was only fair to the members of the Federal Parliament to point out that there was a generally expressed desire on their part to attend, and it was at his request solely that they were not present. It was only necessary to have it introduced and then they could set out their case.

The Industry, an Australian Asset.

With regard to what they had said, there was a great deal which went to show the value of the sugar industry to Australia. He and his Government fully realised that it was imperative it should be carried on and should prosper. In the speeches made they had also given a great number of facts as to the value of the Agreement terminating on 30th June, both to the industry and to the people of Australia generally. Some remarks were also made as to the poisonous remarks that were being made in the Press in the South regarding the industry. They need have no apprehension as to the Government being influenced by comments of this character. They could take his assurance, and he would also tell them that, during the recent campaign for his own part—he did the Southern States, mainly Victoria, Tasmania, and South Australia—everywhere he went he put the case to the people for the sugar industry's protection and preservation in Australia as being vital to our White Australia policy, and he ventured to say that, generally speaking, the people in the South realised that it was essential, and they had no prejudice against the industry itself.

Consumers Benefited by Agreement.

He also dealt right through the campaign with the question of the Agreement which expired on 30th June next. He put the facts with regard to that Agreement and he put a large number of facts they had quoted to-day. He had told the people in the South that the Agreement was one which had conferred a very great benefit on the sugar consumer of Australia, and, without hesitation and notwithstanding the great clamour that was going on in some parts, that that Agreement had been to the benefit of the consumer. He wanted them to realise that the Government approached the question with no prejudices because they had spent some of their time in the South. They had fully realised the importance of the industry to Australia—particularly in connection with our White Australia policy.

Reasonable Safeguards for a White-manned Industry.

That was the Government's view. But the Commonwealth Government, he would remind them, was the Government of the Continent of Australia. Mr. Gillies was connected with the Government of the State of Queensland, and he looked at this question with the view of Queensland and of the things which Queensland desired would happen; but, unfortunately, he (the Prime Minister) was afraid the Commonwealth Government would have to look at it not only from the point of view of Queensland, but from that of the whole of Australia, and hold the balance evenly between all the States. He, the day previously, had dealt with the question of sugar, and therefore was not in quite as embarrassing a position as otherwise he might have been, because he could say something to them to-day that was not anything new. He had not at hand exactly what he said yesterday, but he would say it to them again. He had pointed out the value of the industry. Also he believed that the people of Australia as a whole realised that reasonable safeguards had to be given to protect this white-grown industry against black-grown sugar competition. The question was how that safeguard was to be brought about. It was one about which there might be some difference of opinion. He had said that the Government (and he represented the Government) was not prepared to renew the Agreement which expired on the 30th June. He did not intend that afternoon to deal with the reasons for arriving at that decision. It would take some time and he did not consider it was the proper time to do so. He hoped to visit Queensland in the near future, and would then be prepared to deal with the whole question, and, whether they agreed with him or not, they would certainly find he would not shirk the issue. He would then tell them why his Government was doing whatever they may decide to do.

Non-renewal of Agreement.

Without dealing at length with the Agreement, he could put it broadly and say that while the Government realised it had been of considerable benefit to Queensland and the industry—to which eloquent testimony had been borne by Mr. Gillies and Mr. Pritchard—and while during the period it had operated it had been of great benefit to the people of Australia as a whole, the abnormal circumstances which then obtained had now disappeared, and that Agreement as it was in existence under those abnormal circumstances, if it were continued to-day under normal conditions, would be giving to the State of Queensland preferential treatment and better conditions than we are prepared to extend to any other industry. That, of course, was a thing the Government could not possibly do. The members of the deputation might disagree as to the view the Government was taking, and would argue it out on their views; but that was their view and it was why they would not renew the Agreement.

A Tariff Alternative.

As to the indication he had given yesterday on behalf of the Government as to the manner in which they considered the industry should be safeguarded: it was through the medium of the Customs tariff which was in existence in Australia to-day. There were many industries besides theirs in Australia that needed safeguarding against outside competition, but these were always safeguarded by means of the accepted policy of Australia to protection, and was the proper safeguard for the sugar industry. All he could say to-day was that, and he would point out to them that this was the broad outline of what the Government's actions in the future would be. When they had an opportunity to consider the whole question fully, they would define exactly the Government's position and policy; and, further, they would give them this assurance: that they would do it as soon as possible. As soon as it was possible for them to accomplish the necessary work they would deal with the matter, because they could see the position the industry was placed in, in that it was not certain as to the basis of its future operations. He would give them this further assurance: that the Government would tolerate no political finessing. They would make a commencement as soon as they were able to do so.

There was no more that he could say; but, placed as he was, and in view of the fact that the present Government had held office under three weeks, it was unreasonable that they should be asked to say any more at this stage. All that had been said by the deputation would receive full consideration.

The Prime Minister then explained that the reply he sent to the wire asking for the deputation was sent in their interests, because it appeared to him it was a very long way to come when all he could say was that they really must await the Government's policy. He realised, however, why they wanted to come. He did not wish to speak for the whole of his Government, but he believed he had had sufficient to do with this industry and the problems that surrounded it to say that the difficulties were fairly well known to him. At the same time, when he found they still desired to see him, notwithstanding the fact that it was so early in the life of the new Government, he acceded to their request, and could only say he was pleased to see them, to listen to them, and get any assistance he could in arriving at a correct solution of this matter.

TREATMENT FOR FISTULA.

When a fistula on withers is forming, it is customary to apply a blister or hot fomentations. This on rare occasions appears to effect a cure, but in the majority of cases it hastens the swelling and brings it to a head. After it has broken, surgical treatment is required.

The next thing to find out is the direction and depth of the fistula. This is done by using a flexible probe, some 8 or 9 inches in length. Free drainage must now be given by opening along the full length of the probe, or if thought advisable an opening can be made at the lower part of probe, and a seton of tape or other material passed through and tied on the outside. A seton keeps the wound open and assists in draining the cavity, but the first method of opening up is generally found more satisfactory. Both sides of the withers should be opened, if necessary, and any necrosed (dead) tissue removed. The top of withers should not be opened crossways—from side to side—because there is a ligament which runs along the middle line of shoulders from the head—if cut causes serious consequences.

The chief points to remember are—free drainage, the removal of all dead tissue, and the prevention of pockets where pus can accumulate.

The following lotion should be used every third day on the fistula after it has been opened up, until four applications have been applied:—

Corrosive Sublimate	½ oz.
Methylated Spirits	1 pint

This is best applied by soaking some cotton wool or other absorbent material with the lotion, then packing the saturated cotton wool in the fistula. This treatment can be repeated if necessary after ten or fourteen days' interval. Knives, probes, &c., should be thoroughly disinfected before using by placing them in boiling water or some disinfectant such as carbolic acid, Condy's fluid, &c. Knives and other steel instruments should not be allowed to come in contact with the corrosive sublimate solution.—Major A. H. Cory, M.R.C.V.S.

SUGAR: FIELD REPORTS.

The Northern Field Assistant (Mr. E. H. Osborn) reports under date 16th March, 1923, to the Bureau of Sugar Experiment Stations:—

Mourilyan.

After a very successful season's run, this mill is now being overhauled and added to in anticipation of a large crop this coming season. Although the January rainfall had been rather light, the cane in general looked very well.

Some very fine cane was noticed in the area lying between the Cowley line and the North Coast Railway, in most cases being very clean and showing evidence of thorough cultivation. Among individual growers in the Mourilyan area is Mr. Schilling, who is taking a great interest in the newer varieties of cane. He has now planted out some 7 acres of Q. 813 and about 2½ acres of H.Q. 458, and has had a very good strike. If the tonnage and density of these varieties are good upon this particular soil, Mr. Schilling intends planting a larger area. As the mill chemist is always ready to give information on analyses of canes and other matters to growers, the result of this extension will be of much interest to other local farmers. Some very fine crops of beans were seen. Unfortunately, the high price of landing lime makes it too dear an item now. The completion of the North Coast line will, however, soon change this.

South Johnstone.

Weather conditions were ideal for growth. Some particularly fine Badila was noticed upon Mr. M. Darvenera's river flats. One 12-acre block is just twelve months old, and shows 7 or 8 feet of Badila true to type, which would probably now cut over 40 tons per acre. Bar floods or cyclones, a 60-ton crop should be cut here later on. Another 18 acres were cut in July and replanted in September, and will also develop into a good crop on its present appearance.

Further up No. 6 Branch a splendidly even patch of cane is standing upon this red soil country. In this particular locality all classes of cane, from plant to even sixth ratoons, look very green and healthy, and carry a vigorous growth.

Among other red soil areas also showing up well is that known as Miskin's Points, consisting of, say, 300 acres of really good land. Some splendid cane was noticed in the area that lies east from Miskin's towards Stewart's Creek. On No. 7 branch there is an area about the same size carrying fine cane. Upon Mr. J. Velouta's farm is a patch that was cut in September and replanted in October, now carrying good cane. Although this cutting and replanting straight away may appeal to a grower with new and rich ground, it is a practice that will surely result in soil exhaustion.

Nerada Line.

Cane, generally speaking, looks better than it has done for some years. So far, with the exceptioin of a very slightly affected patch near the 12½-mile, the area seems free from grubs. Some very good D. 1135 plant was noticed growing upon an area that was formerly grubby. On No. 1 branch some very good cane was noticed on the alluvial flat country. Most of the country inspected was very clean and free from weeds.

Maria Creek Soldiers' Settlement.

Since my last visit this centre has gone ahead rapidly, and is now quite a compact little township, containing a school with an attendance of about thirty, and two general stores. As one of these stores delivers its goods by means of a motor lorry, it will be easily understood by older visitors to the district how much improved are the roads. There are now eighty settlers, of whom twenty-five are married, and mostly living in the compact little houses built by the department. Most of the cane (all Badila) seen was very fair. About 5,000 tons of cane were railed to the mill last season. Fourteen thousand tons are expected for the coming year. A very large amount of clearing and planting is now being carried out, so 1924 should show a large increase on all the above figures.

Among the farms that looked well were those of Messrs. Applegreen, Borden, Barrett, and McAlonan. These are situated south from El Arish, across Maria Creek, and are upon a reddish, slightly sandy volcanic soil carrying a fair number of small stones. Some good cane was also noticed on Messrs. Pedley's, McIntosh's, and

Carney's farms. This soil is mostly a deep yellowish or chocolate loam, and should last well. All these farms looked well and showed careful cultivation. Unfortunately, there are also a number of others that show that very little work has been carried out since crushing. As the settlers now know how rapid weed growth is in this unstumped and new country, they should certainly strive to keep down all weeds. No country will grow good cane and weeds at the same time. Referring again to the whole South Johnstone area, it can be safely said that it all shows signs of great prosperity. New houses and substantial cane cutters' quarters are to be seen throughout the district, and large areas of land are being got ready for the plough.

A very large number of farmers still avail themselves of the proximity of the Experiment Station, and are now growing small patches of such canes as E.K. 1, E.K. 28, H.Q. 458, Q. 903, 7 R. 428, Q. 813, D. 1135, and others. Most of these canes when seen were carrying a very vigorous growth and promised to develop into heavy crops.

Babinda.

Conditions were very favourable to the good growth of cane. Although backward in growth, the cane is of a very healthy colour, it has stooled out excellently, and carries a splendid top. In most cases the late planted cane and also the later cut ratoons looked better in comparison with earlier planted and earlier cut ratoons. The cold weather experienced about the earlier part of the crushing was responsible for this. Generally the cane is very clean, free from weeds, and shows careful cultivation.

Among the farms visited, Mr. S. H. Warner's property, known as 67, looked very well, some of the ratoons having had a dressing of 6 cwt. of mixed manure applied in two dressings. Prior to planting, another block of young plants was limed with from 4 to 5 tons of crushed limestone to the acre. This all looks very well. Upon Buckland's branch a great deal of work has been carried out. Very large areas are being stumped. Across the Russell River, Messrs. Harwood and Co. have about 100 acres of very fine deep yellowish alluvial planted, and looking splendid.

The Southern Field Assistant, Bureau of Sugar Experiment Stations, Mr. J. C. Murray, reports under date 28th February, 1923, as follows:—

Cooroy and Eumundi.

Since last visiting Cooroy a little extra work has been done in planting cane for the mill, but as yet the farmers are doubtful as to whether the haulage to the rail will not seriously cut down their profits. Much good land is available for sugar-cane growing, and, perhaps, if stable prices prevail, this will in time be connected with tramlines. D. 1135, as a young plant crop, is looking well, but H.Q. 285 and Q. 813 are also good canes for this area. Shahjahanpur No. 10 is also to be recommended.

At Eumundi there is more ploughable country than at the former place, the long valley running west from the township being very suitable for cane on a fairly extensive scale. Mr. Cook, a farmer in this locality, has a very fine showing of sugar-cane, including the varieties H.Q. 285 and Rappoe. Varieties to be recommended are Shahjahanpur No. 10, Q. 813, H.Q. 285, and D. 1135. Rappoe is not recommended, owing to its high susceptibility to "gumming disease."

The district seems fairly free from injurious cane pests or fungoid parasites, although small grub infestations are in evidence.

Nambour.

There is every chance of a heavy crop. On Petrie's Creek and the Maroochy River there has been a considerable influx of new farmers, who are working with energy and enthusiasm, and it is gratifying to note that most of them have first-class crops. The main problem in these localities is drainage, and the following remarks on the benefits of thorough drainage may be of use:—The most important effect of drainage on soil is that it makes it warmer. A wet soil is cold, made so on account of the cooling process of the constant evaporation which always occurs on wet soils. Warmth is very essential for the germination and growth of sugar-cane, and it is the coldness of a poorly drained soil, more than an excessive amount of water, that is responsible for unsatisfactory crops. Drainage allows the air to enter the soil. Air is a very important agency in making the soil productive. Plants must have air

or they will not strike. The soil bacteria that makes fertility cannot flourish without air. Although it may appear strange, draining a soil helps to conserve the moisture when it is most needed. In explanation of this, it might be stated that drainage lowers the main body of water in the soil, thus increasing the volume of soil above it in which the roots of the plant can feed. Plants use only film water, or that which lies round each soil particle, therefore the larger the body of soil above the water-table, the greater the feeding space, and incidentally the greater the available plant food. A soil is more friable after it has been drained than before, therefore it can absorb and hold more film water and its capillary action is also stimulated. So it is that a wet soil is dryer in a wet period, and more moist in a dry period than before it was drained.

Cane pests are not causing a great deal of damage on the Nambour area, although on the Maroochy River a small black beetle is appearing and attacking the cane underground, causing, in some instances, severe losses. Cane varieties that are making a good showing in the Nambour district at present are Q. 813, E.K. 1, E.K. 28, C.S.R. 1, C.S.R. 3, H. 227, H. 277, J. 247, Shahjahanpur No. 10, H.Q. 144, M. 16804, M. 1900 Seedling, M. 189, D. 1135, and H.Q. 285.

Farmers are advised to give these canes careful attention and observe them from a point of view of determining their resistance, susceptibility, or tolerance to disease. Striped leaf disease and gumming are showing in places in D. 1135, but as yet only primary symptoms of the former were in evidence.

A visit was made to the Mount Coolum areas. Great progress has been made here during the last two years, principally in the drainage of the swamp and the extension of the tramway through to the beach. That splendid crops of cane can be grown on the drained areas has now been proved, as about 14 acres planted on what was once a morass, is evidence. A motor tractor did the work prior to planting. Cane varieties that are looking very well in this district are Q. 813, E.K. 1, and H.Q. 285. Excellent fertilising results are being obtained with basic superphosphate on plant cane.

A visit was also made to Mapleton while in the Nambour district. The cane in this scenic area looks well, and a number of varieties obtained by Messrs. Story and Anderson from Bundaberg Sugar Experiment Station are making excellent progress. These canes are Q. 813, E.K. 1, Q. 970, Q. 1098, and Q. 1121. M. 1900 Seedling and H.Q. 285 are also making a very satisfactory showing.

Beenleigh.

Rain is badly needed in the Beenleigh district, although if the cane could get showers soon there would be a fair crop, especially with those growers who have continuously cultivated. During dry spells plenty of cultivation is imperative, as this keeps whatever moisture that is available in the soil. At Pimpama Island Mr. Heck is contemplating considerable extension of tramlines, which should greatly increase the district's output. This gentleman has brought his mill to a high standard of efficiency, a consideration which is always reflected in a farming community by an increased output.

Cane varieties making a satisfactory showing in the Beenleigh district are D. 1135, Q. 813, Badila, B. 208, and Mahona. The farmers are advised to concentrate on growing the two first named, with a small acreage of Badila and B. 208, provided the latter remains healthy. They are advised to discard most of the other canes that are not included in the above list, excepting any which stand out conspicuously, or newly introduced canes undergoing observation.

Marburg.

Very dry weather conditions prevail here, and the cane that is growing has had a serious setback. No large areas are under cane, the farmers being under the disadvantage of not having a local mill. However, the soil in this district is of an excellent quality, and good tonnages of cane could always be grown in ordinary seasons, provided the farmer kept above frost line.

Canes obtained from the Bundaberg Experiment Station include Q. 813, Q. 970, Q. 1098, E.K. 2, E.K. 1, E.K. 28, and Shahjahanpur No. 10. The drought, however, has been severe since these were obtained, and it is improbable that they will make a good showing.

Thanks are due to the different farmers met, for their invaluable kindness and courtesy.

CANE PEST COMBAT AND CONTROL.

The Entomologist of the Bureau of Sugar Experiment Stations located near Cairns (Mr. Edmund Jarvis) has submitted the following report dated 20th March, 1923, to the Director (Mr. H. T. Easterby):—

Field Experiments with Para-dichlorobenzene.

Experimentation with this fumigant was commenced on 17th January, when a plot of Badila (August planting) measuring 264 by 66 feet (one-fifth of an acre) was treated with ¼ oz. injections, placed 7 inches deep, 12 inches apart, and from 4 to 6 inches from stools. The rows on this plot at Greenhills were fumigated on one side only, and when examined about a month later it was seen that the cane had grown vigorously, while the odour of para-dichlorobenzene was quite noticeable in the soil a few inches away from injections.

About one-third of the chemical had evaporated, so we may, I think, conclude that in the case of ¼ oz. doses situated at a depth of 7 inches, ten weeks or longer might elapse before complete evaporation. On 25th January a plot of first ratoons of D. 1135 (measuring 172 by 32 feet) growing on red volcanic land owned by Mr. P. Martinuzzi, at Meringa, was treated on each side of the rows with ¼ oz. injections, 1 foot apart, 6 inches deep, and 4 inches from the canes. Being situated on the brow of a high ridge, this land is usually more or less grub-infested each season, so that we hope to get conclusive results later on. At the time of injecting, these ratoons were about 3 feet high, and the soil was rather dry, while the depth of cultivation varied from 6 to 8 inches. A second plot, separated from the other by a check plot, and consisting of a strip measuring 14 by 472 feet, received similar treatment to the preceding, except that injections were placed 18 instead of 12 inches apart.

When examined about a fortnight later a smell of para-dichlorobenzene was noticeable an inch or so below injections (in the unworked subsoil) and the odour had penetrated upwards to the surface and throughout the soil in a lateral direction between the points of injection. In loose soil it could be smelt 9 or 10 inches away. About one-sixth of the crystals had evaporated. A month after application the cane on both treated and check plots had grown considerably, the leaves just meeting between the rows.

Effect of Fumigation with Para-dichlorobenzene on Sugar Cane.

About a fortnight after injecting close to cane stools it will be noticed that two or three leaves on plants here and there commence to wither from the point downwards. This characteristic browning, which appears mostly on the outer leaves, does not often extend farther than from 12 to 18 inches from the point, the basal portion of the leaf remaining green, and continuing to grow in a normal manner. Many stools, however, remain quite unaffected, although standing in the same row and having received exactly similar treatment.

This leaf-browning is probably due to one or more roots having been bruised or broken by the injector, thus allowing fumes of para-dichlorobenzene to enter the injured portion and affect the normal activities of the cellular tissue.

Fumigation of a plot of first ratoon Badila cane on block K. 4 at Greenhills was commenced on the 16th instant, injections being made on both sides of rows, 4½ inches deep, 12 inches apart, and 2 inches from stools. Grubs at the time of injecting were mostly in the second stage, while the cane was about 3 feet high.

Effect of Poisonous Plants on Cane-grubs.

The possibilities of this form of control have not been altogether overlooked, results of a more or less encouraging nature having occasionally been obtained by us. There is a popular impression to the effect that such plants as sorghum, white mustard, &c., if ploughed into the soil, will poison any grubs chancing to feed on the rotting foliage.

Experiments with both of these plants were carried out by the writer during 1921, when it was found that grubs after devouring young sorghum plants (about

9 inches high) and mustard leaves, were not injuriously affected, but on the contrary, appeared to be plumper and more active, as though such diet agreed with them. Similarly, when fed with the foliage of *Tagetes glandulifera* (Stinking Roger) they manifested increased vitality. In this case, however, our various experiments went to show that cane-grubs have a decided liking for the leaves of this weed, so that the plant might perhaps prove useful as a trap crop. Possibly this liking may furnish an explanation of various reports one hears about the freedom from grub attack noticed in those canefields around Bundaberg where "Stinking Roger" happens to be one of the commonest weeds. Whilst experimenting in 1922 with species of *Jatropha, Datura, Asclepias,* &c., our most promising results were obtained from plants belonging to genus *Crotalaria.* The possibilities of this genus as a factor in cane-grub control are still under investigation here, and may yield interesting data in the near future. In this connection, I should like to acknowledge assistance received from Mr. F. B. Coleman, of the Department of Agriculture, Brisbane, who has been good enough to forward me seeds of various poisonous plants for experimental purposes.

Carbon Bisulphide for Cane-grubs.

Canegrowers would do well to bear in mind that eggs deposited by the first brood of grey-back beetles (which started to emerge on 22nd December) were hatched about 10th January, producing grubs which at the present time are mostly in the second stage, while eggs laid by the brood of beetles which appeared later, about the middle of January, are nearing the end of the first instar. During the next few weeks fumigation of the soil with carbon bisulphide should be carried out on areas presumed to be grub-infested, the ground at present (26th February) still continuing in good condition for such treatment. Operations in this connection were commenced this season at Greenhills on 14th January, at a time when grubs were mostly in the first stage, or had just moulted into the second. The soil at that time was fairly dry, although moist enough to retard upward evaporation of the fumigant. On some of the blocks treated, many of the stools examined appeared to be free from grubs, or but slightly affected, while others gave decided evidence of infestation. Grubs for the most part were feeding among the surface roots, at depths varying from 3 to 5 inches, and although the ground was examined to a depth of 2 feet or more, none were found below 9 inches. No time should be lost while the cane continues small enough to get among, and grubs can be destroyed before large enough to work appreciable damage. In the event of heavy rain occurring, fumigation should, however, be discontinued for a few days, until excessive moisture has drained away, and left the soil sufficiently open for the fumes of bisulphide to freely penetrate in all directions. When examining a block thought likely to be grub-affected, several stools in various parts of the field should be dug around, in order to gain an approximate idea of the percentage of grubs per stool, of their size, and the depth at which they are lying.

The fumigant should then be injected an inch or two above them, care being taken to close the holes made, by pressing the surface-soil with the foot after each injection. When treating very young plant-cane injection on one side of the rows is sufficient, while for ratoon or early plant-cane it is often advisable to treat both sides.

Tachinid Fly Parasite of Cane Borer.

Our rearing of these parasites has been discontinued of late owing to difficulty in procuring borer-infested canes from which to obtain grubs for our cages. These flies do not appear to breed as readily in sticks of D. 1135 as in Badila, owing perhaps to canes of the former variety being thinner, less juicy, and containing a larger percentage of fibre. Canes of Badila retain their moisture for a longer period when placed in breeding cages than is the case with D. 1135, which, if transferred during hot weather, does not always root in time to prevent shrinkage of the rind. Occurrence of the cane-borer last season at Freshwater near Cairns has been brought under our notice recently by the manager of Hambledon Mill, and we hope in the near future to liberate tachinid flies at various infested centres in that district.

Other applications for parasites have been received from Mirriwinni, Mount Sophia, and elsewhere.

THE COMMON FRUIT FLY *(CHAETODACUS TRYONI).*

SOME ELEMENTARY FACTS.

In response to a request of the Tingoora Local Producers' Association, Mr. Henry Tryon, Government Entomologist, supplies the following elementary facts:—

1. The fruit fly, otherwise known as the fruit maggot fly, is a small two-winged insect with a body that, measuring about 3-10th inch in length, is pale reddish brown in varied tints, and conspicuously marked with a few yellow spots. The female fly, usually rather longer than its consort, has a top-shaped pointed hind-body, whilst that of the latter is semi-oval in outline.

2. This insect attacks almost every kind of cultivated fruit raised in Queensland. Also, some of those of our forests and scrubs, for it is an Australian native. Not all, however, are equally injured by it.

3. The fruit fly manifests four different phases of growth:—(*a*) the fly, (*b*) the egg, (*c*) the maggot, and (*d*) the pupa or chrysalis.

4. Its injurious connection with the fruit commences with the deposition of the egg therein, and thereupon until the next phase of life is completed, and it is then a full-grown maggot; it lives within it, being increasingly injurious as it attains this degree of development.

5. The egg, in establishing this connection, is placed by the female fly by aid of its penetrant ovipositor beneath the skin of the fruit assailed, either singly or in batches of several—eight or more; whilst, again, more than a single fly may thus place its eggs in any single fruit. The variation in the number of eggs that any fruit receives, and that may range from one to fifty or more, depends on its size and on its consistency at the time, amongst other features; whilst, again, there are characteristics in certain fruits that influence the measure in which further stages in the insects life may be realised, and whether even it may develop into a destructive maggot at all or may not.

6. Of the two successive life phases of the insect—that of the egg and that of the maggot—directly associated with the fruit, the length of the duration of each is dependent on varying factors, and therefore not always the same; the temperature influencing that of the egg, and this, and the food supply immediately available, that of the latter.

7. The egg phase usually lasts about three days, whilst the maggot may become full-fed in ten days.

8. When full-fed the maggot leaves the fruit ordinarily on this fruit falling to the ground, as it usually does as the result of maggots infestation, but sometimes, when the fruit remains notwithstanding attached, it still issues from it.

9. If free to do so, it thus enters a short distance into the soil; if not, it remains otherwise concealed.

10. On having done so it changes to the chrysalis or pupa, this life phase being attained within twenty-four hours or less. This ordinarily happens, but when the soil is very dry it apparently cannot so transform.

11. After an additional ten days (sometimes seven may suffice for this), the pupa has given rise to the fly again, and this, unless prevented, has found its way to the surface and into the free air.

12. The fly feeds upon sweet substances of many origins, including the nectar yielded by certain flowers.

Conclusions.

(*a*) These facts, pertaining to the common fruit fly of the State, will explain its rapid increase with the progress of the seasons.

(*b*) Again, the existence of fruit being necessary for the fly's existence, and its actually for a time in its life becoming voluntarily imprisoned therein, will suggest not only a means of control arising from this circumstance, but how it can become disseminated through man's agency. Nature, it is true, places limits in its numbers. Its active life and developments are, in fact, then, determined by the lower winter temperatures of the southern and of the more elevated northern parts of the State, and again it has its parasitic and predatory foes. But notwithstanding the fruit-growing industry, whilst it provides the opportunity for its increase, also provides that for exercising measures for its subjugation.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF FEBRUARY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING FEBRUARY, 1923 AND 1922 FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Feb.	No. of Years' Records.	Feb., 1923.	Feb., 1922.		Feb.	No. of Years' Records.	Feb., 1923.	Feb., 1922.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	9·05	21	3·94	23·72	Nambour	8·34	26	5·91	21·26
Cairns	15·04	40	11·22	22·03	Nanango	4·26	40	1·93	2·66
Cardwell	16·60	50	5·32	41·29	Rockhampton ...	7·40	35	0·42	11·73
Cooktown	13·42	46	8·82	7·52	Woodford	8·67	35	2·88	11·51
Herberton	7·23	35	3·60	16·34					
Ingham	15·26	30	4·32	35·78					
Innisfail	21·51	41	14·51	44·09					
Mossman	15·01	14	8·78	23·54	*Darling Downs.*				
Townsville	11·61	51	0·27	13·31					
					Dalby	2·87	52	0·32	2·28
Central Coast.					Emu Vale	2·26	26	0·00	1·33
					Jimbour	2·83	34	0·03	2·23
Ayr	8·82	35	0·12	9·18	Miles	2·64	37	0·07	2·53
Bowen	8·55	51	0·93	12·94	Stanthorpe ...	3·31	49	0·20	1·41
Charters Towers ...	4·37	40	0·37	5·24	Toowoomba ...	4·31	50	0·97	4·63
Mackay	11·54	51	1·38	11·11	Warwick	3·12	57	1·10	1·77
Proserpine	10·58	19	1·56	19·53					
St. Lawrence ...	7·93	51	2·29	12·50	*Maranoa.*				
South Coast.					Roma	3·07	48	1·35	1·68
Biggenden	3·59	23	0·41	2·90					
Bundaberg	6·04	39	0·48	9·60	*State Farms, &c.*				
Brisbane	6·27	72	0·69	7·55					
Childers	5·77	27	0·61	8·17	Bungeworgorai ...	2·69	8	1·21	0·64
Crohamhurst ...	13·85	30	3·47	19·68	Gatton College ...	2·84	23	...	3·13
Esk	5·37	35	0·15	6·19	Gindie	2·68	23	...	8·96
Gayndah	4·09	51	0·12	1·85	Hermitage ...	2·35	16	...	1·71
Gympie	6·50	52	1·48	12·00	Kairi	6·70	8	...	26·49
Glasshouse Mts. ...	7·96	14	4·32	16·69	Sugar Experiment				
Kilkivan	4·94	43	1·45	4·92	Station, Mackay	10·23	25	2·09	10·78
Maryborough ...	6·40	51	5·18	7·25	Warren	3·93	8	...	7·32

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for February, 1923, and for the same period of 1922, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
State Meteorologist.

BOT FLY.

To prevent the flies from finding a suitable lodgment for their eggs, the long hairs should be clipped off or singed from the nose, lips, jaws, shoulders, and legs of all horses. Regular daily grooming should be carried out to detach any fly eggs, before they have time to hatch, and the parts from which the long hairs have been removed should be smeared daily with a mixture of linseed oil 20 parts, turpentine or kerosene 1 part. All manure containing bots or grubs should be destroyed by burning.

After a horse is affected—viz., when the bot fly grubs are in the stomach—medicines are of little service in removing them until the summer months, when they are being naturally expelled. It is then advisable to drench with one of the following drenches:—

(1) Turpentine, 2 oz., mixed in 1 pint of milk; or

(2) Carbolic acid 2 drachms, glycerine 2 oz., water 4 oz., milk 1 pint.

Either of these drenches should be followed in a few hours by giving 5 drachms of aloes, as a ball, or 1 pint of raw linseed oil.—Major Cory, M.R.C.V.S.

WEEDS OF QUEENSLAND.

By C. T. WHITE, Government Botanist.

No. 31.

THE RUBBER VINE (*Cryptostegia grandiflora*).

The Rubber Vine (*Cryptostegia grandiflora*) has for some years past been a naturalised weed in parts of Northern and Central Queensland. Of late years it has become a considerable pest along some of the Gulf rivers, and at the urgent request of the Etheridge Shire Council the plant has been declared a noxious weed throughout the State. There is, practically speaking, little or no possibility, however, of the plant becoming a pest in the southern parts of Queensland.

Description.—A rampant climber, often of shrubby growth when growing in the open, the stem, leaves, and seed vessels exuding a milky sap when cut or broken. Leaves glabrous, elliptic, 2½—4 in. long, 1¼—2 in. wide. Flowers large, borne in terminal cymes; corolla from almost white to lilac purple about 2 in. across. Seed vessels (follicles) 4—6 in. long; seeds very numerous, each with a tuft of long, white, silky hairs at the apex.

Distribution.—Native country probably Madagascar; common cultivated or naturalised in most tropical countries.

Botanical Name.—*Cryptostegia*, from the Greek *kryptos*, hidden, and *stega*, a covering from the essential parts of the flower being concealed in the throat and not exposed as in neighbouring genera.

Properties.—The plant yields rubber of commercial quality. Samples of the rubber collected from plants growing at Charters Towers and submitted to the Dunlop Rubber Company by this Department in 1910 were reported on as being worth 3s. to 3s. 2d. per lb. (then rather a low figure). The following interesting report on this rubber was made at the same time by Mr. Howard Newport, Instructor in Tropical Agriculture, at Cairns:—

"*Cryptostegia grandiflora* has been recorded for many years as producing rubber of fair quality in India, Madagascar, and elsewhere. The rubber is commercially known as 'Palay.' The plant has been experimented with, I believe, in the Calcutta, Peradeniya, and other agricultural and botanical institutions, but has not been received by planters with favour.

"Palay rubber belongs to a group of rubbers collected from the stems of vines or creepers, generally by a process of cutting up the whole of the aboveground growth (and sometimes the root also) for subsequent extraction of the latex by natural exudation from the cut surface, by crushing or grinding, or by boiling, &c. In either case the vine is destroyed and has frequently to be left for considerable periods (sometimes ten years) before sufficient new growth has taken place to make another collection worth while. Hence vine rubbers, though of good quality and valuable where found growing wild in scrub or forest areas, have not met with a favourable reception as plants for cultivation in plantations, comparing unfavourably with trees such as Para, Ceara, Castilloa, Assam, &c., which can be tapped continuously for many years.

"It may be noted that the price quoted for the samples obtained from Charters Towers—viz., 3s. to 3s. 2d.—scarcely indicates a high quality in view of the fact that fine hard para rubber at the time was 9s. 6d. per lb., and the very worst and dirtiest 'negro head' wild rubber 2s. 6d. to 2s. 9d. per lb., and hence it is doubtful whether it would pay to collect this with white (even child) labour at the price, but considerable improvement may be possible."

Poisonous properties.—The "Rubber Vine" belongs to a family—the Asclepiadaceæ—containing a number of plants possessing poisonous properties. I have heard of no cases of stock poisoning from the plant, but animals rarely if ever touch it.

Eradication.—Where possible the plants should be grubbed out and burnt. Where growing very thickly spraying with an arsenical weed-killer might prove effective. The Agricultural Chemist has recommended the following as a suitable spray for weeds. "Half a pound of arsenic, dissolved by means of ¼ lb. of caustic soda, in 3 gallons of water, and this solution then diluted to 10 gallons with water."

Botanical Reference.—*Cryptostegia grandiflora* R. Brown, in Botanical Register t. 435 (1819).

Plate 57.—Rubber Vine (*Cryptostegia grandiflora*).

A.—Flowering shoot. B.—Seed pod (follicle). C.—Seed.

SOME NOTES ON SILAGE WITH SPECIAL REFERENCE TO STACKS.

By H. C. QUODLING, Director of Agriculture.

Silage stacks suffer deterioration if an attempt is made to hold them over from season to season. Best results are obtained by building them at the latter end of Summer, in the flush season, and using the fodder in the Winter or Early Spring.

It is evident that the dairymen and sheep farmers of our agricultural districts will never come into their own until their stock can be satisfactorily carried through the winters and over any dry spells which may occur.

Increased land values, and a general all-round rise in the cost of living and, similarly, in that of production, may be cited as reasons for keeping stock in condition and in a state of efficient productivity consistent with ruling conditions.

Cultivated crops and artificial pastures are doing much in effect, but seasonable shortcomings can only be met by looking to the contents of the barn for dry feed, and to the silo or stack; in this latter instance is to be found a palatable, ready-to-hand form of succulent fodder, which should be provided on every farm where live stock are kept for profit. Many arguments may be advanced in favour of silage, but it is felt these are not required where practical thinking men are concerned, whose chief inquiry is for reasons to prove to their intelligence that, by adopting certain methods of conserving fodder, they are to get a *quid pro quo* for their outlay, be it in labour or in kind.

Queensland's rich soils and generous summer rainfall are responsible for crop growths not attainable in the more temperate parts of the Commonwealth; and when such tangible results are to be so easily secured from Nature's garden, it is certain that a stockowner's desiderata in the matter of a supply of the right class of fodder will be readily attained by an extension of the self-help methods common to all who have to wrest a living from the land.

Inquiries through the medium of the Department on silo construction and its attendant features are sufficiently numerous to indicate that interest has been aroused in the subject of fodder conservation.

It is not proposed here to dilate on the merits of different silos or advocate possibly out-of-reach methods likely to act as a deterrent on account of an initial outlay of capital but rather to deal only with a section of the subject with simple and economic features designed to meet local and existing conditions.

Plate 58. Sledge cutter at work in an immature crop, showing manner in which stalks are laid down by means of guide rod.

A number of silage demonstrations have been carried out by Departmental officers, and, although evidence in a general sense is not wanting to show the possibilities of fodder conservation, it is more fitting that the words of those farmers who have followed out the methods advocated may be made known to others who contemplate erecting silos or stacks.

Extracts from their manuscripts are as follows:—

"The stacking of maize was finished on Saturday, 3rd May. All are well pleased with the way the lever worked. It was rigged up so that the bundles were slung right over the side into the middle of the stack, and the earth for weighting (6 tons) was put up in the same way. We started feeding the silage to the cows straight away, and they took to it greedily, and are showing an increase already, so we are reaping the benefit of stored fodder."

"The ensilage is very good, and the cows would tear the stack of maize down to get at it."

"I think the method of stacking all that can be desired—that is, when one cannot afford to build a silo. It opens up splendidly, in my opinion, with very little waste, and stock eat it readily, notwithstanding that we had to cut the crop (maize and sorghum) on the green side, on account of being afraid of frost. The cows chase the dray as soon as they see it, and milk well on the fodder."

"It has been the means of storing from 100 to 160 tons of silage (sorghum and maize) which might otherwise have been spoilt."

"In 7 weeks after stacking, I commenced to use the silage, and came to the conclusion, in a very short time, that I had a valuable asset from a feeding point of view. I fed in boxes at the rate of 40 lb. per diem per cow, and cows which had been in milk from 4 to 8 months increased their flow fully 50 per cent. Cows which have newly freshened keep up their normal first flow unceasingly, and that during winter. It is better to feed after milking than before, and I am at present obtaining an A1 grade from the factory for my cream. . . . am well satisfied with the experiment, and have come down to the bed-rock conclusion that, as soon as funds will permit, I will erect a silo, as, after some years' experience, it has been found that one cannot 'dairy' in the winter on artificial grasses with profit, and ensilage appears to be a *par excellence* winter ration. The sorghum ensilage is chaffed with a small percentage of sugar-cane, in order to carry it through the chaffcutter, as it is not the best stuff to chaff by itself."

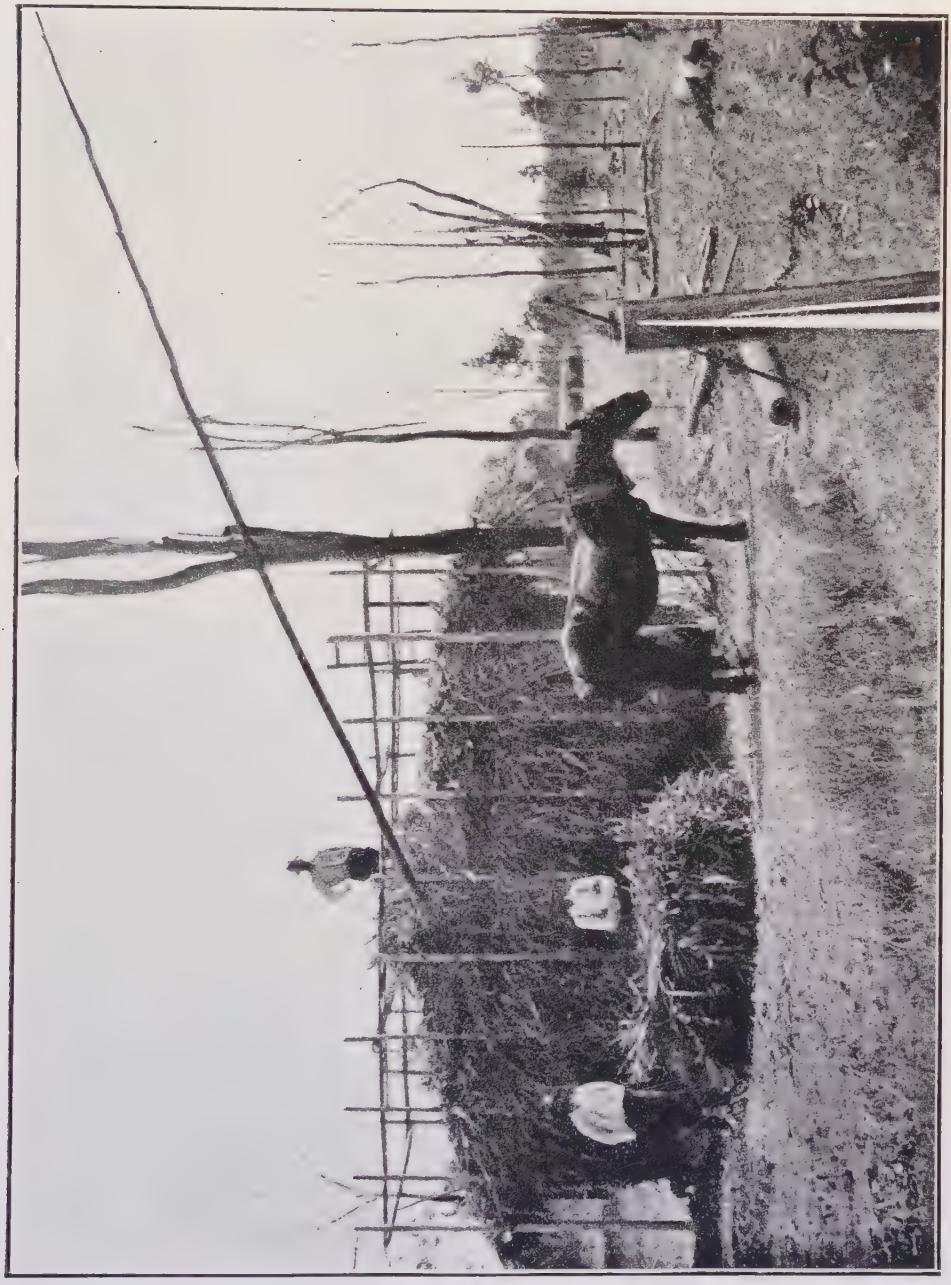


Plate 59.—Stack in course of construction, showing projecting "untrimmed" ends, also "whip" hoist attached by means of a chain to a dead tree.

"Maize and sorghum were sown in alternate rows. Owing to dry weather, there was only a light crop; a reaper and binder was used to cut the crop, and the carting was done with rough sledges, each drawn by one horse; stacking began on 26th March, and the stack was opened in the second week in July. After cutting down the first bench of about 9 in. as waste, it was found to be in good condition. The cows did not take to it at first, but the calves ate it well. One by one, however, the cows began to eat it, and now nearly all of them are feeding on it, some of them taking it greedily."

"We are milking 22 cows, and it is a significant fact that a pronounced increase in the milk yield has followed. As they have no other change of food, I can only attribute this increase to the silage. As the feed* in our paddocks is now becoming poor, and there is little prospect of its improving for a month or so, I view the silo, with its stock of compressed fodder, with great satisfaction, as I believe it will tide our dairy herd over the critical period of the year. This is its great value, and I more than ever see the wisdom of having laid by this winter store of food. During the coming summer I shall build a much larger stack on the same pattern, and hope to put by 70 or 80 tons of maize and sorghum for the winter. I assure you of my complete satisfaction at the result of your experiment on my farm."

"Am very well satisfied with the experiment and will build a considerably larger stack next year, all being well. I am not using up to the full amount, but what I am is keeping my cream and milk supply up to its regular amount; other hay, such as lucerne, oaten, and, at times, bush hay is mixed with it. My cows, when it was first offered to them, did not seem to care about eating it, but now they have got used to it, they nearly go mad to get at their feed."

"I opened one end of the stack to see what it was like, and am glad to say it is first class. I am perfectly satisfied with the experiment, and intend going in more for it in the future. When stacking was finished I put in 18 inches of earth on top, sloping from centre of stack to the ends; then five wires across the top and hung very heavy logs to them; two persons who have examined the stack, and know stack ensilage in other parts, state that it is in excellent condition."

Instances are not uncommon where maize crops have made good growth up to a certain stage and then failed to set grain through the

* Principally Rhodes grass.

Plate 60.—Stack silage demonstration at dairy inspectors' special silage instructional course, Queensland Agricultural College, Gatton, 1919.

dry weather. In the Southern Burnett part of the 1916 crop was affected in this way. Altogether about 50 stacks were erected in this locality alone, some ranging to 150 tons capacity.

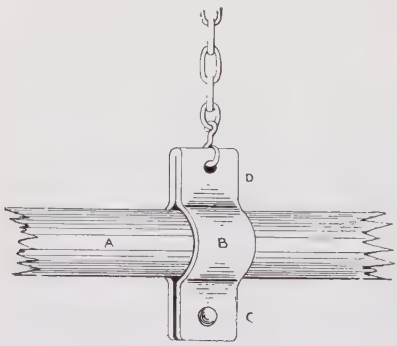
Again in 1919 officers of this Department held demonstrations in silage making, and travelled through several districts with the object of assisting and advising farmers who were determined to turn their wilted crops to good account for fodder purposes, upwards of 12,000 tons of fodder being conserved, which assisted in saving the lives of many valuable dairy stock.

Inquiries made since show that the silage was found to be of great value and of satisfactory quality.

POINTS TO BE OBSERVED.

Maize is one of the best and most satisfactory crops to grow, but any ordinary crop which is commonly used for green fodder or hay will make good silage.

The amount of labour involved in the handling of bulky green fodders may be considerably reduced when machinery is available for cutting and for binding into sheaves.



CLAMP FOR SUSPENDING WHIP.
(*a*) Whip spar.
(*b*) Clamp made from an old tyre 4" × $\frac{5}{8}$".
(*c*) Clamping bolt.
(*d*) Clamp welded and bored for hook.

Where large quantities of fodder are to be handled, a mechanical hoist is required for the higher levels of the stack. For hand work the "whip" type is preferable. In connection with the erection of a "whip" it is necessary that some means be adopted to prevent the spar slipping at the point of suspension, and the clamp shown in the sketch is an effective and useful means of preventing this. A substitute which is also very effective may be obtained by using an ordinary chain strong enough for the purpose and forming a "clove" hitch at the point of suspension, afterwards nailing on two small hardwood blocks to the "whip" spar, one above and one below the position of the chain on the spar; or drive in two strong iron staples. For horse power a yardarm and spar, with suitable blocks and the necessary wire rope and clutching dogs, make an effective combination, or pulleys and tackling may be substituted.

Fodder stacked in the open is subjected to an atmospheric pressure of 15 lb. to the square inch; and the stacker's chief concern should be to check combustion as much as possible—*i.e.*, by preventing the access of air to the mass.

Waste is unavoidable at ends and sides and is to be expected. A 25 per cent. depreciation will take place under indifferent conditions of stacking. The loss under good conditions should not be more than 12 per cent., provided attention is given to salient features and to working detail.

Coarse or fairly mature fodders require a greater dead weight pressure, and do not compact as readily as finer and more succulent plants.

Emphasis is placed on the fact that the success of a silage stack depends very largely on the consolidation of the contained fodder so as to exclude air, which, if admitted, would cause rapid deterioration.

"Use plenty of weight when stack is completed."

Variations in temperature are factors in the chemical and biological changes which take place in the process of turning a mass of green fodder into silage, but it is unnecessary to go to any more trouble than to check the processes of oxidation and fermentation which are responsible for high and abnormal temperatures. When undue heating takes place during the process of stacking, the temperature of the mass is readily reduced by putting on more green fodder, and by throwing a series of wires across the stack and hanging heavy logs to them; this may be done at the close of each day's operations. Where a limited number of animals are kept, long and narrow stacks are preferable, as the lesser superficial surface is exposed at the ends when feeding out. The higher the stack, in keeping with facilities for hoisting, the better.

It takes from 50 to 56 cubic feet of consolidated silage to make a ton. Crop yields may be computed and the dimensions of frame work arrived at. Abnormal settlement is to be expected, and weighted stacks usually settle down finally to a little less than two-thirds of their original height.

Heavy crops like maize and sorghums should be evenly sown in regularly spaced drills to facilitate harvesting by machines; the production of a medium thickness of stalk with a maximum of leaf should be aimed at.

Immature crops produce a less palatable and inferior article from a feeding standpoint. Where maize is to be chaffed into a silo, the crop may be left standing until the plants acquire the most nutriment—*i.e.*, when the grain attains the soft dough stage.

For stacking, it is an advantage to cut when the grain is in the "milk" stage before the stalks become too firm. Sorghum, Japanese millet, panicum, &c., should be cut when the seed heads or panicles are well formed and the grain about half developed.

The Stack.—The site should be chosen on a naturally drained piece of ground, and handy for feeding out to the stock, and yet as close to the crop as it is possible to get it.

Plate 61.—Framework and "trimmed" stack, showing an extra pair of uprights at each end, to which a crosspiece is attached for supporting the ends of the fodder when stacking.

When computing prospective contents of stacks several factors require to be taken into consideration, amongst which are—

Material used for silage;

Condition of crop at time of cutting;

And the amount of dead weight to be subsequently added to consolidate the stack.

Sorghums and millets are inclined to pack tightly and afford, on this account, a heavier average weight to the cubic foot than maize.

The following table of contents of various sized stacks may be taken as approximate; sorghums and millets, as previously mentioned, will weigh somewhat heavier:—

SIZE OF PERMANENT STACK AFTER ENDS ARE TRIMMED.

Feet.		Tons.
12 × 9 × 15	=	42·6
12 × 10 × 15	=	47·3
15 × 9 × 15	=	53·3
15 × 11 × 15	=	65·1
18 × 10 × 15	=	71·0
18 × 12 × 15	=	85·2
21 × 12 × 15	=	99·4
21 × 14 × 15	=	116·0

In setting out a frame for a stack 18 ft. by 10 ft., ten poles on each side would be required, arranged as follows:—

Poles require to be 17 ft. 6 in. in length, and about 5 or 6 in. in diameter at butts. Sink the holes 20 to 24 in. in the ground. Top plates and tie beams should be securely twitched on close to the top of uprights, to make the framework rigid.

When long-stalked crops are to be stacked, a fair average distance apart to place the uprights is 3 ft.; for shorter-growing crops this distance should be lessened accordingly.

Construct a framework of bush poles similar in design to those in accompanying illustrations, the dimensions of which and distances between the uprights being arranged so as to accommodate the amount and class of fodder on hand. Plant the poles firmly in the ground; attach the top plates with a wire twitch at a height of, say, 15 ft. from the ground. Brace across at ends and at centre, taking care that the pair of poles intended for carrying the central brace or tie are carried up high enough to give head room for the stacker when moving about on the upper levels of the stack.

Single horse hoist for Stacking ladder.

The uprights may be spaced at a distance apart of 3 ft. along the sides for maize and sorghums, and a minimum of 2 ft. for crops like barley and panicum. An extra pair of uprights should be put in at each end of the framework and braced securely: a crosspiece is attached to these to carry the projecting ends of the fodder until such time as they are trimmed off, the crosspiece subsequently being moved higher up to serve a similar purpose.

The position of that portion of the top plate, proving to be in the way for the "travel" of the whip, may require to be altered temporarily, or brought down to a lower level, and afterwards raised as stacking progresses.

The framework is of no value once the stack has settled down.

The "corn binder" is the most approved machine for cutting and binding maize and similar strong-growing crops into sheaves.

Plate 62.—Sledge cutter 5 feet 6 inches long by 2 feet 4 inches wide, showing projecting scythe blade (passed through mortice), also angle to set guide rod.

Lighter classes of crops may be handled to advantage with an ordinary "reaper and binder" or back-delivery "reaper."

The secret of handling heavy crops is to keep the stalks parallel in the bundles, whether cut by machine or by hand.

Maize and sorghums, if standing fairly upright in the drills, may be cut with a sledge cutter, which is simply a narrow sledge, set on a pair of runners and decked with 6 in. by 1 in. boards—a scythe blade

is attached at one side at an angle adapted for slicing off the stalks, and should be braced in such a way as not to interfere with the cutting. Fix a guide rod to lay the plants down evenly in a regular swarth. They can then be kept fairly parallel when gathering them into bundles. For hand work an ordinary cane knife is very suitable.

Sledges are the handiest for short hauling distances; when the "hoist" is used, the fodder should be loaded on to suitably sized rope slings to be ready for lifting off.

Before commencing to stack, open out a shallow drain around the outside of framework, and use the soil for levelling off any surface inequalities within it. Place a layer of about 6 in. of waste green grass on the ground. Start stacking on this and KEEP ALL THE STALKS LAID THE ONE WAY. Transverse layers admit air far too much into the stack. Place the tassel end of the maize at least 3 ft. 6 in. over at both ends of the stack. When placing down the next layer, reverse the order, and if the fodder is at all on the dry side, damp it with water, and take the precaution also of placing some of the leafy portions of the fodder over any bare patches which may be present. When a height of about 3 ft. has been reached, lay down a board flush with a pair of uprights which are to form the true ends of the stack, and trim off the projecting ends of the fodder. Before starting to stack again, move the crosspieces up the outside pair of uprights, in order to support the ends of the second tier of fodder. Repeat the process of stacking and trimming off as previously noted.

A minimum thickness of not less than 2 ft. 6 in. of fodder should be stacked each day.

Keep a good camber in the centre of the stack, as heating soon causes abnormal settling there. Use judgment when binding the layers back, so as not to have any bumpy joints where the laps come. Care should be exercised in placing fairly straight stalks along the sides, and these should be well firmed down between each pair of poles, the laps being carefully watched to prevent any spaces being left.

The trimming of the ends, which should be done with a plain hay knife, ensures a consolidated section exposed to atmospheric influences, but the carefully concealed over-lapping of the stalks at the sides is essential for keeping the air from penetrating the mass; the more the air is kept out, the smaller the percentage of loss.

Settling takes place rapidly as soon as the mass begins to heat.

As previously noted, wires, heavily weighted, should be thrown over the stack at night time, attention being paid to the placing of separate wires within a few inches of each end of the stack where it is trimmed off. Remove wires and weights before continuing to stack next morning. Allow a big margin for settling. When finished to a full camber, spread

Plate 63.—Stack built on Mr. T. Chay's farm at Wetheron under the supervision of the Department of Agriculture and Stock.

a layer of several inches of soft green grass or other close-textured weeds immediately on top of the silage; water this well. A framework of logs should then be placed evenly on top of the completed stack; these should be halved at the ends in a similar manner to the ground plates of an ordinary building. The weighting material is evenly disposed over the whole surface of the stack, the logs keeping the loose soil, or any other kind of material used to supply the weight, in its place. The layer of soil must average about 12 in. in thickness. The stack should then be topped off with bush hay or other waterproof material. A neat finish should be given to the roof, which requires to be built to a full eave, and all loose straws raked off. Wires are then placed across the top, and well weighted in order to keep them in position.

OTHER WEIGHTING MATERIAL.

Stones, where they are easily procurable, may be substituted for soil, and the spaces between the stones can then be filled, if so desired, by soil.

Permanent weighting material is readily prepared by filling kerosene or benzine tins with concrete or with cement and sand compo., twisted wire handles being inserted in the mixture before setting takes place. This latter system economises labour where silage-making becomes a regular institution on the farm.

Although it is an advantage to allow the stack several weeks in which to settle down, and afford the necessary time which is required to effect the metamorphosis "from green fodder to silage," it may be opened at once, should the fodder be then required. All that is necessary is to throw off some soil at the extreme end of the stack and cut down a narrow bench from top to bottom. The covering of soil on top keeps the rest safe from the weather.

Stacks are not meant to last more than a few months on account of depreciation from exposure to the weather, but instances have occurred where they have been kept for years, and then used to advantage. (Silage will keep, however, for many years in a well-built silo, and the depreciation is infinitesimal.)

Better results are obtained by chaffing the silage before use, and its passage through the chaffcutter is facilitated by using any strong-stalked fodder to assist in carrying it through.

A handy method to provide for feeding out to animals is to make receptacles, to act as makeshift troughing, out of ordinary 4-bushel sacks strung on No. 8 wires. Pairs of round uprights are put in at opposite ends of a line of fencing, the character, length, and gauge of which are designed to carry the sacks strung out on or sewn at each side to No. 8 fencing wires, running parallel to one another and placed at

Plate 64.—Stack in course of construction at Bowenville, Darling Downs. Weighting material (stones) being hoisted by a horse prior to the topping off of stack with bush hay.

such a width apart as to form the suspended sacks into receptacle of the desired depth. Crosspieces may be nailed to a series of pairs of intermediate posts, and the holes for the wires bored through these to suit. The same class of feeding receptacles may be used for sheep, but should be made narrower and kept at a convenient height from the ground for feeding.

BRIEF NOTES ON SILAGE AS FOOD.

"Silage is not a perfect food, and must be supplemented by other fodders and concentrates where full milk production is looked for."

Plants like maize, sorghum, and similar fodders, which contain a relatively high proportion of carbohydrates (starch, sugars, &c.) used in an animal's system for maintaining bodily heat, do not form perfect foods until more protein or flesh-forming substances are added in proportion, recognised as suitable in the aggregate, for making up a balanced ration. Leguminous plants—lucerne, cowpeas, field peas, &c.—are designed by Nature to supply this deficiency. In practice, it is found that the succulence of silage assists in the assimilation by animals of dry foods and cured fodders.

A good combination of food for one day, sufficient for the support of one cow of 1,000 lb. weight, when yielding up to 3 gallons of milk, is arrived at by feeding 45 lb. of maize silage and 15 lb. of lucerne as hay or chaff; another ration, equally suitable, but not quite so rich, may be made up by using 40 lb. of the former and 20 lb. of cowpea chaff. The nutritive ratios of the fodders noted work out at 1 : 4·73 and 1 : 6·16, respectively. Analyses of fodders and silage present many variations. A general average per head per day for the support of a number of milch cows, when other feed is scarce, may be set down at 40 lb. of maize silage and 15 lb. of lucerne chaff. With this as a basis, the feeder is in a position to use his intuition and judgment in dealing with the individuality of animals.

QUEENSLAND TREES.

By C. T. WHITE, F.L.S., Government Botanist, and W. D. FRANCIS, Assistant Botanist.

No. 19.

THE SCRUB BEEFWOOD.

The Scrub Beefwood (*Stenocarpus salignus*) is not a very well-known tree in Queensland, except in the extreme south-eastern portion of the State. The trees attain a height of about 80 feet with a barrel diameter of about 2 feet. The barrel is sometimes flanged at the base. The bark is brown, often finely wrinkled or striated, and when cut is seen to be brownish pink in colour. The species is found in the rain forests ("scrubs") of Eastern Australia from Illawarra, New South Wales, to the south-eastern part of Queensland, in and around the Macpherson Range. The timber is of the silky oak type, and is used for purposes in which silky oak is employed.

Photo. by the Authors.]

Plate 65.—Scrub Beefwood (*Stenocarpus salignus*).
A tree in the rain-forest of Roberts Plateau, National Park.

Photo. H. H. Mitchell.

PLATE 66.—A SAMPLE PACK OF AFRICAN FRUITS FOR ENGLISH MARKETS. EXHIBITED AT A.N.A. EXHIBITION, MELBOURNE.

Photo: H. W. Mobsby.]

Plate 67.—The Queensland Exhibit, Australian Natives' Association Exhibition, Melbourne, 1923.

STUD STOCK STUDIES.

BEST BREEDS OF PIGS FOR QUEENSLAND CONDITIONS.*

BERKSHIRE.

This is the most popular breed in Queensland, and is acclimatised. It readily suits itself to the surroundings under which it is kept.

Characteristics of the breed may be described as follows:—

The Berkshire is symmetrical in outline, a good grazer, fattens rapidly, and when kept growing from birth should be fit for the bacon curer at from five to six months, and weigh when dressed from 100 to 120 lb., thereby furnishing a range of weight favoured by bacon manufacturers.

Colour, black, with a plentiful supply of fine-textured hair; white blaze on face; white feet; and white tip to a curly tail. Above medium size; head broad with decidedly dished face; ears thin, velvety in texture, erect, rather inclined forward; jowl full and carrying well back. Chest, wide and deep. Back, long and straight. Ribs, well sprung. Belly, deep, with full and thick flanks, giving good underline. Hams, broad, deep and fleshy down to the hocks. The pig should be well and firmly set on his legs, which must be short, straight, and nicely set apart. Action, smart and active, with an even, regular gait. A good thrifty, all-round pig, admirably suiting practically every district in the State.

The Berkshire has a robust constitution and is of a docile temperament, and rapidly responds to good food and care.

Berkshire sows make good mothers; they are fairly prolific, and litters of from eight to ten are not uncommon in well managed herds.

YORKSHIRE.

Of the three kinds originally brought to this State—viz., Large, Middle, and Small York—the Middle York alone has maintained popularity.

As a distinct white breed it has many excellent qualities, but these are discounted by the fact that unless the pigs have access to plenty of shade and grow an abundance of hair to protect them, they become scurfy in the skin on exposure or sunburn rapidly.

This drawback limits the distribution of this breed to the more temperate parts of the State.

The Mid. York is a hardy, robust, good constitutioned pig, with early maturing characteristics. It possesses a distinctive capacity to fatten evenly and rapidly, but if kept too long in the fattening pen has a tendency to lay on too thick a layer of back fat.

Other characteristics of the breed are as follows:—

Colour, distinct white with pink skin, showing a freedom from blue-coloured spots or markings.

Medium in size and of an even, symmetrical, well-rounded appearance.

Head, short, wide between the ears; face, dished.

Except for the above distinctions and a pure white, abundant coat of silky hair, the other attributes of the breed are to be considered as in the same category as the Berkshire.

---

*From "Pig Raising in Queensland" (E. Graham and H. C. Quodling), Dept. Agriculture and Stock, Q., Oct., 1922.

Plate 68.—Berkshire Boar.

Plate 69.—Berkshire Sow.

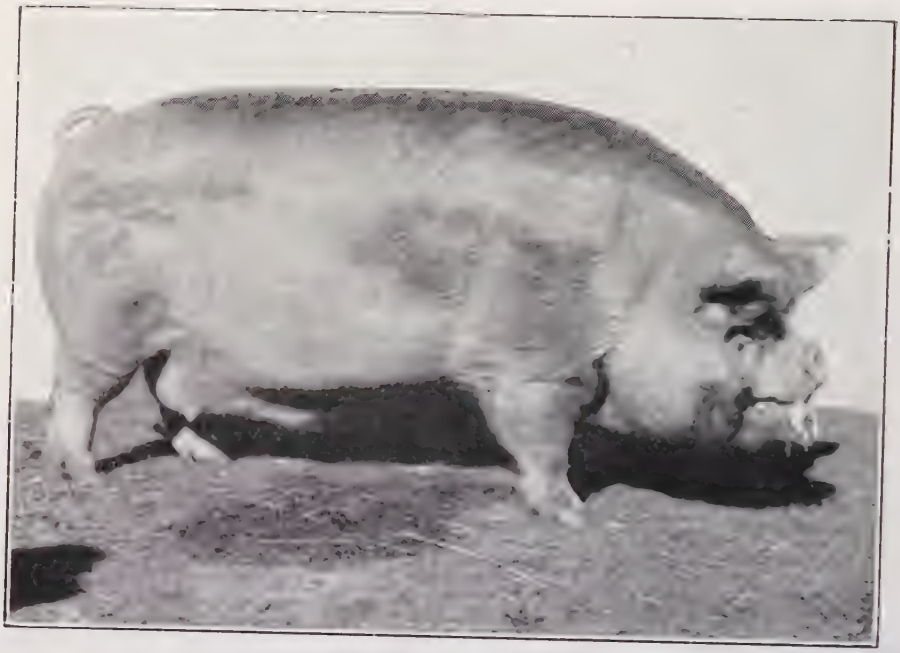


PLATE 70.—MID-YORK BOAR.

PLATE 71.—MID-YORK SOW.

AN OUTSIZE EGG.

"It is the biggest hen's egg I have ever seen," said the Government Poultry Expert, when displaying recently an enormous hen egg. Mr. Beard explained that the egg was laid by a Black Minorca hen, fifteen months of age, the property of Miss Paxton, of Kelvin Grove. The egg measured 9¼ in. by 8¼ in., and weighed 6¾ oz. One egg previously laid by the young Minorca weighed 4 oz. Nine days after laying her mammoth egg the hen died. The egg was opened by Mr. Beard in the presence of the owner, and it was found to contain another ordinary full-sized egg, perfectly shelled. The space between the shell of the big egg and that of the smaller one contained only albumen, no yolk, but the smaller egg contained the yolk, and no albumen. In only two previous instances has Mr. Beard known of such a freakish occurrence, but in neither of these previous cases was the egg nearly so large.

Plate 72.

SMOKING OUT A PEST.

An Important Cotton Field Experiment.

An important and efficacious experiment in dealing with a cotton pest was conducted at Whinstanes, near Pinkenba, recently, in the presence of Messrs. G. Evans (Cotton Specialist, E.C.G.C.), W. G. Wells (Cotton Adviser), and C. Clydesdale (Assistant Instructor in Agriculture). On a Duranga seed (stud) plot of 5 acres there was a fine-looking crop, and since the late rains a new flush of flowers and squares had come along. It had been noticed, however, that a large proportion of the

PLATE 73.—SMOKING OUT A PEST—THE COTTON FIELD BEFORE FIRING.

squares were dropping off, and an examination disclosed that the crop had been attacked by a kind of worm.

Walking through the fields the experts discovered a moth that was there in countless numbers, and was busy laying eggs in the young squares. The grub was boring into the squares, and the boll was dropping off, which meant that all prospects of a good crop were being ruined. It was therefore deemed highly desirable to try

PLATE 74.—SHOWING STACK OF TARRED RUBBISH TO WINDWARD OF THE COTTON ROWS.

to drive out the moth before it affected all the squares. An experiment was arranged in the form of a small series of fires to windward of the plot. The fires were built up out of dead grass, leaves, and twigs, with a little coal tar added. This gave off dense smoke, which was carried through the plot by the wind, and had the effect of driving out all the moths. A flight of swallows followed the fugitives. The experiment was repeated in order to clear out any stray moths.

"This was an interesting experiment," said Mr. Evans, "and if, as we hope, it proves efficacious, it has the great advantage of being applicable on a large scale,

Plate 75.—Well Alight.

and any farmer can adopt it. If the experiment had not succeeded the crop referred to would have been reduced 25 to 30 per cent."

There is a good lot of these insect pests on the coastal belt, he added, and there was going to be a stiff fight against them. The experiment was first tried in the Central district, where the maize worm had attacked a cotton crop. It was such a success that it was decided to repeat it to free cotton of the boll worm.

Further experiments will be carried out in the Dawson Valley. The accompanying illustrations show various phases of the experiment:—

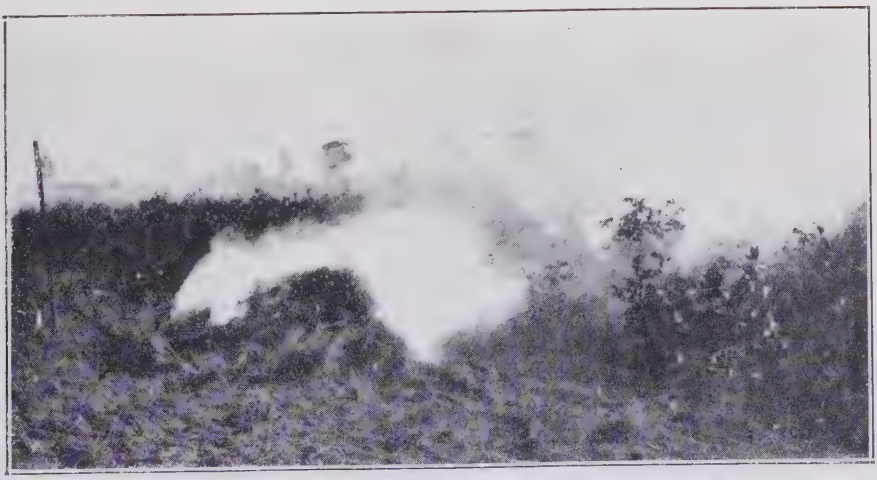


Plate 76.—A Burning Stack.

PLATE 77.—AN EFFECTIVE SMOKE SCREEN.

HOW TO PICK COTTON.

Modern Methods.

Cotton picking is the great problem of the cotton growing industry, though certainly not the only one that will have to be contended with in Australia. Many attempts have been and are still being made to perfect a mechanical picker, but so far without much success. The best brains in America have devoted time and study towards solving this world-wide problem, without so far achieving any definite result.

Plate 78.—Cotton Seven Weeks Old, W. Kraatz's Farm, Tallegalla.

Still, there is hope for the future, and it is quite possible that a mechanical picker can be perfected that will pick cotton for ¾d. per lb. It has been pointed out that in pre-war days, in America, the cost of picking was ½d. per lb., and that at that price not much incentive was given to develop a picking machine. Now, however, with the rapid rise that has taken place in the cost of living in that country, and the

Plate 79.—Cotton Eleven Weeks Old, W. Kraatz's Farm, Tallegalla.

consequent rise in wages and the cost of picking, inventors and engineers are now turning to the perfecting of a machine that will assist very materially the old hand method. Already in this country several people have taken up the problem of machine picking seriously, and Australians, with their proved inventive ability, can be relied upon to tackle the task, as they have others, that, on the surface, seemed impossible.

Hand Picking.

For the present the hand picking of cotton is the only way there is of harvesting the crop, and the British-Australian Cotton Association, Limited, furnishes the following useful hints and suggestions, which will enable pickers to do the work in the best way and with the least cost. Cotton picking may be a little tedious, but it is certainly not laborious. It calls for a quickness of the hand and eye, and a degree of physical strength not apparent to an onlooker. The methods of picking followed are numerous. In Queensland last season many people picked into kerosene tins, which were then emptied into large sacks. Others had a small bag that was fastened on in front of them and would hold about 10 lb. of cotton. The drawback of this method, as with the kerosene tins, is that one loses time emptying it, and the weight of the cotton is all on the body. This hampers movement.

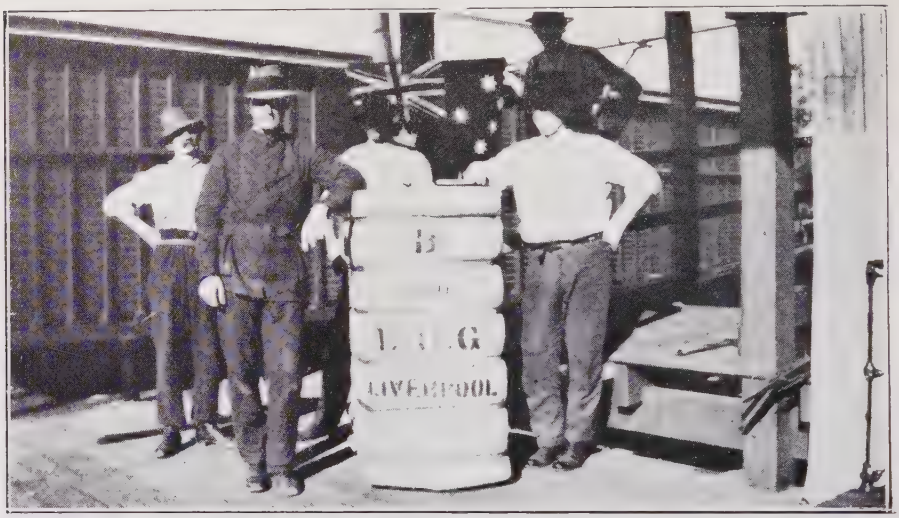


PLATE 80.—THE 300TH OF THE GINNED BALES AT WHINSTANES FOR EXPORT TO LANCASHIRE.

Use Suitable Bags.

The usual American picker uses a canvas bag about 2 ft. wide and 8 ft. long. A simple, cheap, and very serviceable cotton picking bag to correspond to this can be made in the following manner:—Take two corn-sacks and sew them together from top to bottom, cutting the bottom of one. This will give a bag 8 ft. long. Tie a strap on top of this bag to go over the right shoulder so that the mouth of the bag is on the left side just above the hip. If the two ends of the strap are tied on to the bag, at a distance apart of less than half the circumference, the mouth of the bag will always stay open. This bag will cost 1s., can be made in a few minutes, and will be found to last for a considerable period. The bag is dragged on the ground between the rows behind the picker; there is no weight on the picker's shoulders, and it will hold about 40 lb. of cotton.

A Warning.

Many erroneous ideas exist here as to cotton picking, one being that cotton must be picked as soon as the boll opens. This, the Association points out, has resulted in pickers going over their fields numerous times, with the consequently low tally and high cost of picking. The cotton can remain on the bush for at least two or three weeks without being damaged. Nature protects the cotton fibre by enclosing it in wax, and the seed cotton is non-absorbent. A continuous rain for many days would,

Photo. by D. W. T.]

Plate 81.—Mr. James Todd's Cotton Field, Mountain View, Biggenden.

Photo. by D. W. T.]

Plate 82.—A Promising Cotton Crop, Mountain View, Biggenden.

Photo. by D. W. T.]

PLATE 83.—AMONG THE FIELDS OF COTTON, MOUNTAIN VIEW, BIGGENDEN.

Photo. by D. W. T.]

PLATE 84.—THE MOUNTAIN VIEW HOMESTEAD.

of course, tend to stain the cotton and lower the grade, but a day or two of heavy rain, such as is likely to be experienced here, followed by a sunny day, would not stain or damage cotton. Field experts have seen a Queensland field of opened cotton, on which during May and June 10 in. of rain fell, and yet not over 1 per cent. of the cotton was damaged. Operators should wait until one-quarter or one-third of the cotton is open before starting to pick. Three pickings over the field will be all that is necessary; and the last one being made after the frost has checked the bush and opened all the green bolls.

Rough Grading in the Field.

In many cases two pickings will be quite sufficient, the first taking the biggest percentage of the crop. Do not mix the cotton from the separate pickings—send them to the gin as picked. The last picking after the frost has checked the bush is usually of a lower grade owing to the presence of immature cotton, and should always be sent to the ginnery separately, never mixed with the previous pickings.

How to Pick.

In picking, the operator should start on the outside row, and pick one row at a time. They will find faster picking can be done than by taking two rows at once. They should work their rows so that the long bag is dragging between two picked rows and so not damaging any open cotton bolls. The American picker wears leather knee pads, going on one knee to pick the bottom bolls. The art in cotton picking is to work with both hands, each independent of the other. The actual picking is not a straight pull out, but the fingers and thumb fit into the lock of the boll and the hand is given a twisting or levering motion, bringing the cotton away. A good picker will pick three or four bolls, keeping the cotton in his hand before transferring it to his bag. This is an economy of motion, and will save thousands of movements of the hand in a day. In commencing picking, get into the right method from the start; speed will come later. Pick with two hands at the same time. Avoid getting leaves and trash in with the cotton, and do not commit the worst cotton picking offence —leaving a part of the cotton in the open boll. Cotton left in this way is lost, as no picker could be expected to get these small pieces in a following picking. By leaving a small piece of cotton in every boll a good percentage of the crop would be left on the bushes. Pickers need not lose time in the morning waiting for the dew to dry. The cotton can be picked with the dew on it, but that cotton must be spread out in the sun and dried. After rain, wait until the cotton is dry before picking. Be careful not to pick green or immature cotton, that is, cotton from partly opened bolls. This cotton is damp, and can be instantly recognised from the fully matured and dry cotton. Cotton that is dry and from fully opened bolls requires no drying or treatment after being picked. It can be packed into bales or sacks in the field, so avoiding any unnecessary handling.

Packing.

The ordinary woolpack will hold about 350 lb. tramped in with the feet, the chaff sack about 90 lb. The Australian Cotton Association will return a woolpack to growers in place of the one received on receipt of 6d. each to cover handling and freight. No chaff sacks will be returned. Woolpacks cost about 3s. 6d. each, and can be used many times. All bales or sacks must be plainly branded with the grower's name and address. This will avoid confusion and the trouble of identifying packages. In the field a frame could be made to hold the woolpack, and the pickers empty their bags into it, and the cotton tramped into the bale. Where chaff sacks are used a slide about 3 ft. wide and 6 ft. long having a platform of this size 4 ft. from the ground will be found very serviceable. At one end of the platform is a circular opening with a hinged iron ring, to which the sack is fastened. The cotton is emptied out on to the platform and some one standing in the bag hole tramps it in. When the sack is full, the back of the bag hole is detached, releasing it. The advantage of this to the cotton packer is that being on a slide it can be hauled about to any part of the field, thus avoiding long carries by the pickers of their full bags.

Pickers' Prospects.

The amount of cotton picked in a day depends on the ability and quickness of the pickers, the yield per acre, and the cleanliness of the crop. A field free from weeds means a cheaply picked crop, and this fact should not be lost sight of in the growing and cultivation of cotton. In starting out, if a man picks around 75 lb. in eight hours, he will be doing very well. Speed will come with experience, and in a few weeks he should work up to 100 lb., and if he is going to make a cotton picker will surpass this figure in good average cotton. Growers should have in the field a scale to weigh the pickers' cotton as they bring their bags in, and three or four weighings during the day will be found quite sufficient.

The acreage of cotton that one man will be able to pick will, of course, depend in great part on the yield per acre, and his ability. A man who can devote all his time to picking will be able to handle 8 acres. This is taken for a very conservative case of a yield of 800 lb. of seed cotton to the acre, and an average daily picking of 80 lb. This crop would require 80 days' picking, and allowing 20 working days to the month, this will mean continuous work for four months, which is the average length of the picking season in this country. White American pickers do from 150 to 200 lb. a day, and it is felt to be certain that Australians, when they take up cotton picking seriously, will equal, if not surpass, this. The best cotton picker one expert ever saw was an American, who averaged 300 lb. for a nine-hour day over a considerable period. This was done in a field that went 2,300 lb. seed cotton to the acre, and in which only two pickings were made. He points out that this is, of course, an exceptional record.

Fire Prevention.

Great care must be taken to avoid getting matches, pieces of metal, or other material in with the cotton. The cotton is very inflammable, and a spark in the machine during the process of ginning, will instantly cause a fire. The gin is a series of small circular saws, set close together on a spindle, and running between steel ribs, so that a match or piece of metal striking the saws may result in a fire, the metal also damaging the teeth of the saw. Last season many fires occurred in the gins at Whinstanes and Rockhampton, due, in every case, to foreign material in the seed cotton. The collection of articles rescued from last season's cotton was wide and diversified, ranging from pumpkins and eggs to watches and clothing. Corn cobs are a source of much trouble, as they are readily carried to the saws by the fibres adhering to them, and holding them against the breast, thus causing great damage to the saws, the teeth of which are thus broken. The bagging of the cotton in the field as suggested will avoid the inclusion of these articles, and growers should prohibit the use of wax matches by pickers or any one handling the cotton. A spark from a cigarette falling into a bag of cotton may smoulder away for days before reaching the air, and bursting into flames. This matter is important, and too much care cannot be taken to lessen the risk of fire in cotton gins.

DENTITION OF SHEEP.

Age.	Incisors.		Molars.		Number.		
TEMPORARY.							
Period.	No.	Position.	No.	Position.	Temp.	Perm.	Total.
At birth or soon after	2	Central	..	..	..	..	..
	2	Lateral	..	..	..	..	..
	..	Central	..	..	20	..	20
	2	Lateral	12	1st, 2nd, 3rd	..	..	..
	2	Corner	..	..	..	..	..
PERMANENT.							
3 months	..	..	4	4th	20	4	24
9 months	..	..	4	5th	20	8	28
Early. Late Yr. m. Yr. m.							
1 0 1 4	2	Central	..	..	18	10	28
1 6 2 0	2	Lateral Central	16	6th and 1st, 2nd, 3rd	4	28	32
2 3 2 9	2	Lateral	..	..	2	30	32
2 9 3 3	2	Corner	..	..	0	32	Full mouth

Formula of Temporary Teeth.

$$\frac{M.}{3} \quad \frac{I.}{0} \quad \frac{M.}{3} \qquad \frac{3}{3} \quad \frac{0}{8} \quad \frac{3}{3} = \frac{6}{14} = 20.$$

Formula of Permanent Teeth.

$$\frac{M.}{6} \quad \frac{I.}{0} \quad \frac{M.}{6} \qquad \frac{6}{6} \quad \frac{0}{8} \quad \frac{6}{8} = \frac{12}{20} = 32.$$

MAJOR A. H. CORY, M.R.C.V.S.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, MARCH, 1923.

Owing to the dates on which the Easter holidays fell this year, all birds were held until 3rd April, the eggs being counted up to the evening of 2nd, thus making the period of laying 365 days. The weather at the beginning of March was very warm, with hot winds, giving the birds a bad time. There were four deaths, two from apoplexy, one from bowel trouble, and one from peritonitis. The egg production for the year was very satisfactory considering the poor start made at the beginning of the contest. The laying of the light breeds was good, there being very few cases of broodiness to be recorded. On the other hand, with the exception of a few pens, there was a great deal of broodiness amongst the heavy breeds. The team owned by R. Burns finished well, none of his birds having been broody. Mr. N. A. Singer's B bird was still going strong at the close, with 311 eggs, and looked like continuing for another term. The following are the individual records:—

Competitors.	Breed.	March.	Total.
	LIGHT BREEDS.		
*N. A. Singer	White Leghorns ...	113	1,604
C. H. Singer	Do.	109	1,551
*W. and G. W. Hindes	Do.	87	1,450
*Bathurst Poultry Farm	Do.	93	1,352
*S. L. Grenier	Do.	86	1,311
*R. Gill	Do.	79	1,306
*J. M. Manson	Do.	78	1,293
*Mrs. L. Andersen	Do.	87	1,287
*W. Becker	Do.	73	1,273
*H. P. Clarke	Do.	68	1,272
*J. W. Newton	Do.	61	1,235
*G. Trapp	Do.	35	1,232
*W. A. Wilson	Do.	62	1,225
*F. Birchall	Do.	104	1,204
*G. Williams	Do.	47	1,166
*C. Goos	Do.	44	1,162
A. G. C. Wenck	Do.	70	1,162
*R. C. J. Turner	Do.	52	1,157
*R. C. Cole	Do.	51	1,155
*Oakleigh Poultry Farm	Do.	48	1,148
J. H. Jones	Do.	34	1,145
*O. Goos	Do.	56	1,126
*Thos. Taylor	Do.	89	1,122
*H. Fraser	Do.	70	1,121
*Mrs. R. Hodge	Do.	54	1,090
*Mrs. E. White	Do.	57	1,079
*T. Fanning	Do.	25	1,078
N. J. Nairn	Do.	32	1,070
*J. W. Short	Do.	54	1,064
*M. F. Newberry	Do.	35	1,048
*C. M. Pickering	Do.	50	1,038
*E. A. Smith	Do.	68	1,034
B. Hawkins	Do.	40	1,019
A. Maslin	Do.	51	1,011
T. H. Craig	Do.	18	1,002
J. Purnell	Do.	53	989
E. Symons	Do.	69	967
E. Stephenson	Do.	57	951
H. Trappett	Brown Leghorns ...	43	941
G. F. Richardson	White Leghorns ...	20	933
B. C. Bartlem	Do.	23	904
A. Anders	Do.	39	901
Brampton Poultry Farm	Do.	26	879
Parisian Poultry Farm	Brown Leghorns ...	16	590

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	March.	Total.
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	127	1,488
*A. E. Walters	Do.	72	1,216
*C. C. Dennis	Do.	85	1,165
*T. Hindley	Do.	67	1,156
*R. Holmes	Do.	65	1,119
*E. F. Dennis	Do.	56	1,097
Jas. Hutton	Do.	43	1,092
Mrs. A. Kent	Do.	69	1,068
Mrs. A. E. Gallagher	Do.	65	1,050
H. B. Stephens	Do.	86	1,044
*H. M. Chaille	Do.	45	1,033
Mrs. L. Maund	Do.	62	1,028
*Parisian Poultry Farm	Do.	83	987
*Jas. Potter	Do.	52	980
R. Innes	Do.	18	977
Wambo Poultry Farm	Do.	82	944
V. J. Rye	Do.	58	944
W. Becker	Chinese Langshans ...	35	911
C. Doan	Black Orpingtons ...	37	901
*Rev. A. McAllister	Do.	27	901
C. Rosenthal	Do.	65	870
Jas. Hitchcock	Do.	50	858
W. C. Trapp	Do.	56	801
R. Burns	Silver-laced Wyandottes	32	713
*J. E. Smith	Plymouth Rocks ...	19	639
*Miss L. Hart	Rhode Island Reds ...	21	534
Total	...	4,003	75,163

* Indicates that the pen is being single tested.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total
LIGHT BREEDS.							
N. A. Singer	226	311	237	281	254	295	1,604
W. and G. W. Hindes	253	222	245	238	258	234	1,450
Bathurst Poultry Farm	173	217	242	239	268	213	1,352
S. L. Grenier	201	166	228	227	240	249	1,311
R. Gill	246	219	245	236	153	207	1,306
J. M. Manson	235	176	222	198	236	226	1,293
Mrs. L. Andersen	245	179	226	215	222	202	1,287
W. Becker	201	170	223	214	228	237	1,273
H. P. Clarke	217	205	201	232	207	210	1,272
J. W. Newton	222	211	244	194	204	160	1,235
Geo. Trapp	222	184	212	238	176	200	1,232
W. A. Wilson	215	189	158	223	214	226	1,225
F. Birchall	198	229	170	154	237	216	1,204
G. Williams	183	208	213	207	191	164	1,166
C. Goos	142	177	188	215	254	186	1,162
R. C. J. Turner	195	169	219	202	203	169	1,157
R. C. Cole	231	182	213	161	187	181	1,155
Oakleigh Poultry Farm	203	160	205	179	191	210	1,148
O. Goos	185	179	206	223	203	130	1,126
Thos. Taylor	202	164	190	194	194	178	1,122
H. Fraser	197	215	192	153	155	209	1,121

EGG-LAYING COMPETITION—*continued.*

DETAILS OF SINGLE HEN PENS—*continued.*

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS—*continued*							
Mrs. R. Hodge	227	154	171	157	229	152	1,090
Mrs. E. White	197	124	231	148	153	226	1,079
T. Fanning	135	183	203	172	235	150	1,078
J. W. Short	170	166	209	158	186	175	1,064
M. F. Newberry	179	152	161	234	137	185	1,048
C. M. Pickering	208	211	113	163	176	167	1,038
E. A. Smith	163	157	181	192	162	179	1,034
HEAVY BREEDS.							
R. Burns	238	241	229	278	244	258	1,488
A. E. Walters	199	158	164	203	260	232	1 216
C. C. Dennis	183	205	202	180	197	198	1,165
T. Hindley	165	197	130	257	238	169	1,156
R. Holmes	151	209	209	180	175	195	1,119
E. F. Dennis	164	188	213	110	205	217	1,097
H. M. Chaille	189	168	199	162	195	120	1,033
Parisian Poultry Farm	123	160	198	134	180	192	987
J. Potter	158	177	182	144	188	131	980
Rev. A. McAllister	158	183	159	113	95	193	901
Miss L. Hart	81	111	64	126	76	76	534

CUTHBERT POTTS, Principal.

NATIONAL UTILITY POULTRY BREEDERS' ASSOCIATION COMPETITION, ZILLMERE.

FINAL REPORT.

The 1922-23 Zillmere Single Pen Competition was concluded on 31st March. In order to permit of the pens being thoroughly cleansed before the new competition, all birds which were not in a leading position were returned shortly after the middle of the month. This accounts for the apparently low scores recorded by some of the birds this month. The highest individual score for the period of the competition was 295 by a white Leghorn, the property of Mr. J. J. Davies, of Mount Gravatt. Another Leghorn held second place with 281 eggs. Mr. A. Cowley, of the Soldiers' Settlement, Enoggera, being the owner. In the black Orpington section Mr. E. F. Dennis, Kelvin Grove, won with a bird laying 267 eggs, while Mr. T. J. Carr, of King's Creek, was successful in the other varieties with a silver-laced Wyandotte, which laid 219. Certificates were given for all birds laying 250 eggs and over, the following owners being successful:—

WHITE LEGHORNS.

A. Neil, Cannon Hill	256
J. Hutton, Kingsthorpe	260
Oakleigh Poultry Farm, Sunnybank	264
J. Purnell, Torwood	272
P. J. Fallon, Toowoomba	255
J. J. Davies, Mount Gravatt	295
W. H. Lingard, Greenslopes	251
H. Sturman, Birkdale	252
H. Sturman, Birkdale	268
G. Trapp, Toowoomba	258
G. Trapp, Toowoomba	275
A. Cowley, Enoggera	281
R. D. Chapman, Newmarket	262
A. Hodge, Kelvin Grove	263

BLACK ORPINGTONS.

C. C. Dennis, Yeronga	251
E. F. Dennis, Kelvin Grove	267
R. A. Boulton, Deagon	251

Mr. H. Sturman, Birkdale, wins the winter aggregate for first four months of competition, and Mr. J. J. Davies, Mount Gravatt, the aggregate for the period of the competition with 540 eggs. The light variey type prize went to Mr. M. J. Lyons, Fig-tree Pocket, and heavy variety type prize to Mr. H. Pearce, Nundah.

Details:—

WHITE LEGHORNS.

Pen No.	Owner.	March.	Total.	Pen No.	Owner.	March.	Total.
43	J. J. Davies ...	23	295	14	J. Hutton ...	22	217
29	A. S. Walters ...	19	286	20	L. Andersen ...	13	215
66	A. Cowley ...	20	281	49	R. Turner ...	6	215
64	G. Trapp	20	275	9	P. Ruddick ...	10	214
34	J. Purnell ...	22	272	73	A. F. Knowles ...	12	207
7	J. Harrington ...	22	269	80	W. Bliss	17	207
62	H. Sturman ...	17	268	19	L. Andersen ...	0	205
27	Oakleigh Poultry Farm	18	264	22	E. Stephenson ...	6	204
				76	A. J. Bourne ...	12	204
70	A. Hodge ...	18	263	16	T. Flood	14	204
68	R. D. Chapman ...	24	262	8	J. Harrington ...	12	204
13	J. Hutton ...	22	260	78	Kelvin Poultry Farm	15	203
53	A. W. Ward ...	18	259				
63	G. Trapp	20	258	57	M. Newberry ...	4	202
1	A. Niel	0	256	36	Parisian Poultry Farm	7	197
39	P. J. Fallon ...	16	255				
25	P. F. Adams ...	15	253	82	E. C. Raymond ...	11	195
79	W. Bliss	16	253	31	R. H. Woodcock	12	193
61	H. Sturman ...	17	252	59	C. Pickering ...	13	193
55	W. H. Lingard ...	21	251	17	R. Shaw	5	192
52	F. R. Koch ...	18	250	11	J. Potter	4	188
12	J. Potter	16	248	5	Wombo Poultry Farm	6	188
44	J. J. Davies ...	16	245				
77	Kelvin Poultry Farm	9	244	6	Wombo Poultry Farm	0	186
72	Enroh Pens ..	9	241	3	W. Becker ...	4	186
24	M. H. Campbell...	22	241	81	E. C. Raymond ...	3	182
54	W. Ward ...	19	240	38	Carinya Poultry Farm	0	179
40	P. J. Fallon ...	15	239				
23	M. H. Campbell...	19	239	48	M. J. Lyons ...	0	176
10	P. Ruddick ...	14	237	65	A. Cowley ...	1	176
33	J. Purnell ...	9	233	15	T. Flood	9	175
46	H. Needs ...	12	231	60	C. Pickering ...	12	169
56	W. H. Lingard ...	20	229	22	E. Stephenson ...	11	166
18	R. Shaw	16	227	71	Enroh Pens ...	2	166
26	P. F. Adams ...	9	227	75	A. J. Bourne ...	1	162
67	R. D. Chapman ..	1	225	50	R. Turner ...	1	161
35	Parisian Poultry Farm	12	222	45	H. Needs ...	0	154
				4	W. Becker ...	2	154
47	M. J. Lyons ...	13	221	69	A. Hodge ...	1	136
41	G. Williams ...	12	220	32	R. H. Woodcock	0	128
51	F. R. Koch ...	16	223	74	A. F. Knowles ...	0	123
58	M. Newberry ...	15	219	28	Oakleigh Poultry Farm	0	107
37	Carinya Poultry Farm	9	218	2	A. Niel	17	59
30	A. S. Walters ...	17	217				

NATIONAL UTILITY POULTRY BREEDERS' ASSOCIATION COMPETITION. ZILLMERE—*continued.*

Pen No.	Owner.	March.	Total.	Pen No.	Owner.	March.	Total.
	BLACK ORPINGTONS.						
92	C. C. Dennis ...	12	275	87	W. A. Blake ...	2	185
88	W. A. Blake ...	15	274	100	L. J. Pritchard ...	0	184
93	E. F. Dennis ...	23	267	104	J. Potter	7	180
96	R. A. Boulton ...	6	251	86	Kidd Bros. ...	0	179
91	C. C. Dennis ...	18	251	109	Wambo Poultry Farm	14	169
108	E. Walters ...	16	248				
89	T. Brotherton ...	9	234	102	Parisian Poultry Farm	0	167
111	A. Niel	18	230				
105	H. Pearce ...	15	225	98	Enroh Pens ...	9	166
107	E. Walters ...	4	219	110	Wambo Poultry Farm	0	165
95	R. A. Boulton ...	0	214				
101	Parisian Poultry Farm	13	213	83	J. Hutton ...	1	158
				97	Enroh Pens ...	1	157
103	J. Potter	7	204	90	T. Brotherton ...	1	162
84	J. Hutton ...	17	204	99	L. J. Pritchard ...	0	131
112	A. Niel	19	197	94	E. F. Dennis ...	3	117
106	H. Pearce ...	17	191	85	Kidd Bros. ...	0	10
	OTHER BREEDS.						
120	T. J. Carr (S.W.)	20	229	114	Parisian Poultry Farm (B.L.)	16	182
119	T. J. Carr (S.W.)	16	219				
116	G. and W. Hindes (B.L.)	6	194	118	J. H. Jones (W.W.)	4	180
				113	Parisian Poultry Farm (B.L.)	5	141
115	G. and W. Hindes (B.L.)	18	192				
				118	J. H. Jones (W.W.)	0	120

TO POULTRY KEEPERS.

Notwithstanding repeated warnings by the Queensland Society for the Prevention of Cruelty and public reproaches in the Press, crates of poultry continue to be consigned to market under conditions involving cruelty.

Thoughtful persons, for their own protection and in order to secure the best returns for their consignments, will follow the undermentioned directions when consigning poultry to market:—

1. Be sure that the crate is not overcrowded. (Why kill your birds prematurely?)
2. Be sure that there is ample ventilation. (A plain framework crate with wire netting sides and wire netting top, which must not sag, is the best. The public buys best what it sees best. If a wooden crate is used see that ventilation is supplied from the sides as well as from the top.)
3. Be sure that there is room for all birds in the crate to stand upright. (They must have headroom. All birds in one crate should be as nearly equal in size as possible. There will be fewer casualties, and they will look better to buyers, who are inclined to judge by the small ones.)
4. Be sure that there are no gaps between the flooring boards of the crate where birds may get their feet crushed or their legs broken. (Damaged goods are bad sellers.)
5. Be sure that water is available in the crate. (A loose tin is worse than useless. Fix syrup tins at opposite corners of the crate and see that they are filled with clean water before trucking. Your agent can also easily fill them on arrival.)
6. Be sure that food is also supplied in a fixed tin for a long journey. (A drooping, thirsty, or starving bird is a bad seller.)

7. Be sure that while waiting for consignment your birds are not left exposed to rain, wind, or sun. (You can't depend on the porter.)

8. Be sure that you do not deliver fowls, or any other birds, tied together by the legs. (We'll give you no second warning.)

9. Be sure that you do not get prosecuted for cruelty by neglecting to follow the foregoing advice. (We have inspectors at the markets every day, and court cases are costly in time, money, and reputation.)

Issued by the Queensland Society for the Prevention of Cruelty, 14 Fitzroy Buildings, Adelaide street, Brisbane. Telephone Central 647.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS FOR FEBRUARY, 1923.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			lb.	%	lb.	
Pretty Maid of Harelmar	Ayrshire ...	11 Sept., 1922	750	3·9	34·20	
Bellona	,, ...	30 Aug., ,,	690	4·2	33·90	
Royal Mistress ...	,, ...	25 Nov., ,,	750	3·5	30·60	
Confidence... ...	,, ...	13 Aug., ,,	630	4·0	29·40	
Songstress ...	,, ...	4 July, ,,	570	4·2	28·20	
College Meadow Sweet	Friesian ...	18 Sept., ,,	690	3·4	27·30	
Lady Peggy ...	Ayrshire ...	18 Dec., ,,	750	3·1	27·0	
Miss Fearless ...	,, ...	30 May, ,,	528	4·3	26·40	
College Mignon ...	Jersey ..	20 Nov., ,,	480	4·6	25·80	
Thyra of Myrtle-view	Ayrshire ...	22 Aug., ,,	540	4·0	25·20	
Yarraview Snow-drop	Guernsey ...	1 Sept., ,,	420	4·9	24·30	
College La Cigale	Jersey ...	10 July, ,,	330	5·7	22·20	
Fair Lassie ...	Ayrshire ...	1 Sept., ,,	480	4·0	22·20	
Hedges Nattie ..	Friesian ...	20 May, ,,	441	4·3	22·05	
Nina	Shorthorn...	12 Jan., 1923	630	3·0	21·90	
Hedges Dutchmaid	Friesian ...	23 Sept., 1922	510	3·4	20·10	

TREATMENT OF CATTLE SUFFERING FROM THE EFFECTS OF EATING THE WILD PASSION VINE.

It is very obvious that so long as the animals are continually eating the vine, curative measures are only of temporary value. The first measures, therefore, should be taken to prevent the cattle gaining access to the vines. On farms where grazing land is scarce, efforts should be made to get rid of the injurious weed by cultivation or otherwise. This is by no means an impracticable task. The vine grows most luxuriantly in the newly-felled scrub, and such land is useless until such noxious weeds have been eradicated.

With regard to treatment of affected animals: First remove them to fresh quarters so that they are unable to obtain any more vines. They should then be given a drench of 1½ pints of linseed oil, by the mouth, in order to loosen the bowels. Epsom salts are not advisable, as in some cases there is inflammation of the bowels present. Working bullocks should be spelled until recovered. With animals in what may be termed the first stages of the disease—that is, those showing drowsiness and stupor, loss of appetite and condition, &c.—the best remedy is the injection of 18 drops or 1 c.c. of 1 per cent. solution of strychnine under the skin behind the shoulder once a day for a few days (four or five) by means of a hypodermic syringe.

For animals in the later stages, that is where convulsions are appearing, a sedative in the form of 6 drachms of Bromide of Potassium in a pint of water should be given as a drench, providing the animal is able to swallow, but it appears that in some cases this ability is lost. In such cases no drenches should be given at all, owing to the danger of the liquid going the "wrong way" and so setting up inflammation of the lungs. The strychnine should be recommended when the convulsions have disappeared.—Major A. H. Cory, M.R.C.V.S.

THE QUEENSLAND PRODUCERS' ASSOCIATION.

THE WORK OF THE PROVISIONAL COUNCIL OF AGRICULTURE REVIEWED.

A Year of Organisation and Achievement.

On 24th March, 1922, the scheme for the organisation of the Agricultural Industry in Queensland was propounded by the Premier (Hon. E. G. Theodore), at a Conference of Representatives of Dairying Interests within the State, at Brisbane. That gathering was one of the most notable in the history of Queensland and its decisions were of first importance to all engaged in rural pursuits. Out of the Premier's proposals has grown the Queensland Producers' Association, now statutorily established, and which, through its Local Producers, District Councils, and Council of Agriculture, has already laid the foundations of complete agricultural organisation within this State.

The Provisional Council of Agriculture has now handed over the guidance of the Association to the incoming Standing Council of Agriculture elected recently by the Organised Farmers of Queensland.

Subjoined is a review of definite achievements of the Provisional Council in the course of its year of service.

Agriculturists in many lands have been more or less a disunited body, but it is doubtful whether any country can boast of such a comprehensive and generous scheme of agricultural organisation as that which has been made available to the primary producers of Queensland.

The necessity for agricultural organisation had, for some time, been realised, and ultimately it was resolved by the present Government to adopt the policy of placing the farmers themselves, by organisation and State backing, in the position to give consideration to their own problems, and to evolve solutions which would be satisfactory to them. An organisation was created to embrace all agriculturists engaged in all branches of the industry and all shades of political opinion. The scheme was brought to fruition when the dairying industry was passing through a period of depression, and the outline of the Premier's proposals was submitted to a Dairy Conference held in Brisbane on the 24th March, 1922, and was unanimously approved by that conference. It was next decided to obtain legislation to govern the scheme, whereupon the Primary Producers' Organisation Act, and other agricultural legislation, introduced by the Minister for Agriculture and Stock (Hon. W. N. Gillies), was passed by Parliament in the 1922 session. The scheme embraced the following main features:—

Local Producers' Associations would form in every centre. A minimum of fifteen primary producers may form themselves into a Local Producers' Association. Every primary producer is eligible for membership.

The State is divided into nineteen districts, and all Local Producers' Associations have the right to elect the District Council.

Each of the nineteen District Councils will appoint one member to the Council of Agriculture, which holds its meetings in Brisbane.

Each District Council will have a permanent officer, known as the District Agent, who will study the problems of his district, and assist growers, Local Producers' Associations, and the District Council in improving their conditions generally. The first duly elected Council of Agriculture has now been constituted as from the 23rd

March, 1923, and will hold office until the 30th June, 1924. It is made up as follows:—

OFFICIAL REPRESENTATIVES.

The Minister (President), Department of Agriculture and Stock.
James Walker Davidson, Commissioner for Railways, Brisbane.
Arthur Ernest James Charles King Graham, Director of Dairying, Brisbane.
Harold Cecil Quodling, Director of Agriculture, Brisbane.
William Joseph James Short, General Manager, Bureau of Central Sugar Mills, Brisbane.
John Douglas Story, Public Service Commissioner, Brisbane.

Districts as per Order in Council of 21st December, 1922.	Name of Representatives elected to Council of Agriculture.
No. 1	George Henry Pritchard, Secretary, Australian Sugar Producers' Association, Edward street, Brisbane.
No. 2	William Barron Biggs, Earnestholme, Proserpine.
No. 3	Thomas Alfred Powell, Foulden, Mackay.
No. 4	Alexander Evans, Wilmott, *viâ* Larcom.
No. 5	William George Batchler, Oakwood, Bundaberg.
No. 6	Robert Livingstone Boyd, Wetheron House, Byrnestown.
No. 7	Joseph T. Tatnell, Deep Creek, Gympie.
No. 8	James Henry Sigley, Kingaroy.
No. 9	Thomas Henry Brown, Montville.
No. 10	Charles Bateman, Evandale, McMaster street, Nundah.
No. 11	Frederick Matthew Ruskin, Zillmere.
No. 12	Thomas Flood Plunkett, Beau Parc, Beaudesert.
No. 13	John Hardcastle, Dugandan.
No. 14	Thomas Cornelius Hayes, Laidley.
No. 15	George Burton, Ramsay road, Cambooya.
No. 16	James Theodore Tod, Goomburra.
No. 17	William Ranger, Eukey, *viâ* Stanthorpe.
No. 18	Allan McKinlay, Gowrie Junction.
No. 19	Robert Swan, Wallumbilla.

The State Government generously undertook to finance the whole of the organisation for the first twelve months, and a grant of £25,000 was made available to cover operations to the 30th June, 1923. The Act further provides that for the first five years the Government will subsidise the amount subscribed by agriculturists to the extent of at least £1 for £1.

With the one exception of the Director, the Council appoints all its own officers, and administers, without any direction from the Government, all the funds placed at its disposal.

During the past twelve months, a Provisional Council has been acting, and its first meeting was held on the 19th April, 1922. At this meeting the Premier (Hon. E. G. Theodore) outlined the action leading up to the constitution of the Council, and pointed out it would be the duty of the Provisional Council to lay down the policy to be pursued. A committee was appointed to draw up a plan of organisation, and it was decided to appoint a Director to organise the whole scheme. Nine delegates were appointed to visit agricultural centres and expound the scheme. Later fifteen Provisional District Agents were appointed. These called meetings and explained the proposals and the way they were designed for the betterment of the agricultural industry. That success has attained these preliminary efforts will be manifest when it is stated that there are now over 700 Local Producers' Associations with a membership of 20,000.

SPECIFIC PROBLEMS DEALT WITH—ARRANGED UNDER SECTIONAL INDUSTRIES.

DAIRYING.

Herd Improvement—Federal Aid.

The last Commonwealth Government promised to pay cost of transport and quarantine of pure bred stock imported into Australia, and the present Government has been requested to ratify that promise.

State Aid.

The State Government invited the Council to make suggestions in connection with a proposed amendment of the Co-operative Agricultural Production and Advances to Farmers Act, and the Council submitted concrete suggestions relative to the making available of advances for the purpose of purchasing pure bred stock.

Herd Book Societies.

Efforts have been made to secure the adoption of suitable rules by the various Herd Book Societies. Representatives of these societies have met representatives of the Council, and the question is still under review.

Herd Testing.

The Council is circulating, through Local Producers' Associations and other bodies, full information relating to herd testing and its advantages.

The methods adopted in the testing of herds by the Department of Agriculture and Stock have been approved, and Local Producers' Associations, in dairying districts, have been asked to promote herd testing on that basis. Two additional herd testers have been appointed by the Government, and farmers are now taking advantage of the opportunity to test the individual value of their milkers.

Fodder Conservation—Vital Necessity.

The Council recognises the necessity of fodder conservation, and has prepared a practical scheme.

Dairy Buildings.

At the request of the Council the Government has prepared plans of dairy buildings for distribution to producers. The Council has also approved of proposed amendments of the Regulations relating to size of buildings, and has secured modification in the prescribed drainage.

Milking Machines.

The Council requested the Department to take action to secure the cleanliness of milking machines, and the Department has given effect to the recommendation.

Cream Containers.

The Council has co-operated with the Queensland Co-operative Dairy Companies' Association in advocating the use, on dairy farms, of standard seamless containers protected by fly-proof gauze covers, and the various factories have co-operated in securing their general use.

Pasteurisation.

Information regarding pasteurisation of milk and cream has been collected from New Zealand and elsewhere, and the Council has advocated the installation of pasteurisers, where found necessary, in Queensland. The Co-operative Dairy Companies and Cheese Manufacturers' Associations have been asked to assist.

Co-ordination of Factories.

In the matter of the proposed erection of additional butter factories in districts where a factory was already in existence, the Council was able to effect an agreement between the parties concerned and to avoid duplication of plant and effort.

Uniform System of Accounts.

Recognising the necessity of a uniform system of accounts for dairymen and dairy factories, the Council employed a committee of experts to draw up a comprehensive system of accounts to comply with all the conditions required, and the Council has approved that copies of the report with full explanations be sent to all factories. The report is being printed, and will be circulated without delay.

Metropolitan Milk Supply.

The Council has conferred with the Metropolitan Milk Suppliers' Association in regard to the more economic means of distribution of milk, and has drawn up definite rules for the constitution of a milk pool for the metropolitan area. This scheme has been forwarded to the Government with a request that action be taken to create the pool.

Railway Transport.

As a result of the Council's representations the Commissioner for Railways decided to make an all-round reduction of 20 per cent. on the freight of dairy produce. The Council has further brought under the notice of the Railway Commissioner the need of improving the design and increasing the number of trucks suitable for the carriage of dairy produce, and of taking proper precautions for ensuring that such produce would not deteriorate in value through faulty transport arrangements. These matters have received satisfactory attention.

Stabilisation of Prices.

Various attempts have been made to induce the proprietary factories in Victoria to join a scheme for the stabilisation of prices of dairy produce throughout Australia. Delegates have been sent to Victoria, and during their visits to the Southern States were asked to make strong representations in favour of stabilisation. The proprietary factories have not yet consented to join the scheme, but the matter is still being advocated energetically.

Grading of Dairy Produce.

The present practice of dual grading of dairy produce by Federal and State officers is considered to be very unsatisfactory, and the Council has recommended that all dairy produce should be graded by State officials acting for and on behalf of the Federal Government. This decision has been forwarded to the Minister for Agriculture for discussion at the next conference of Ministers for Agriculture, to the Minister for Trade and Customs, and to the State Dairy Standardisation Committee, for discussion at the next meeting of the Federal Council.

Cold Storage.

Through the action of the Council of Agriculture, the construction of Cold Stores at Hamilton was expedited, and at the request of the Council the control of these cold stores has been vested in the Minister for Agriculture and Stock, and the installation of a butter worker has been approved.

Cheese.

The Minister for Agriculture and Stock has agreed that, in order to obviate injury in transit, all cheese intended for export be crated at the factories.

Representation has also been made to the Government with the object of securing to the Cheese Pool Board the effective control of the industry.

Pigs.

Applications from pig raisers have been made for stabilisation of prices in their industries, and several suggestions have been made in regard to marketing of pigs. The question of constituting a Pig Pool for certain districts is under consideration, and the Council is in communication with the Local Producers' Associations in those districts in reference to the formation of such a pool.

Agent-General's Reports.

The Agent-General has been asked to furnish complete reports on the conditions surrounding the handling, marketing, and distribution of Queensland dairy produce in London, and reports are now being regularly received.

Tariff.

The Tariff Board has been interviewed in reference to reducing the tariff on the import of dairying machinery, and with the object of increasing the import duty on dairy produce from New Zealand.

Additional Officers.

Through the efforts of the Council additional Dairy Instructors and Inspectors have been appointed for the benefit of the industry generally.

DEVELOPMENT OF THE WHEAT INDUSTRY.

The Council, in conjunction with the Department of Agriculture and Stock and the State Wheat Board, has formulated a scheme for the improvement of wheat-growers in Queensland.

The scheme provides for the purchase by the Wheat Board from the Department of Agriculture and Stock of a quantity of specially selected seed which will be grown under special conditions. Wheat so grown will be reserved for seed purposes.

A new list of recommended varieties has been drawn up, and these varieties have been allotted to certain districts where each will be planted on specific classes of soil.

The Council recommended that assistance be given to needy farmers in want of seed wheat for planting, and, as a result, the Department of Agriculture and Stock has arranged accordingly with the State Wheat Board.

MAIZE.

With the view of organising maizegrowers, the Department of Agriculture and Stock, on the recommendation of the Council, arranged to collect statistical and other information for the purpose of enabling the Council to prepare a concrete scheme for the betterment of the conditions of the maizegrowers generally. The returns received by the Department indicated that the growers were not at present unanimously in favour of a Maize Pool.

The duty on imported maize under the general tariff rate is 3s. per cental. Under the Tariff Agreement between South Africa and the Commonwealth, maize of South African origin is admitted into Australia at a duty of 1s. per cental. The question of increasing the duty on maize of South African origin is to be considered in connection with the new Reciprocal Tariff Agreements between that country and the Commonwealth.

The Council circulated amongst the Local Producers' Associations a statement on the maize question and the value of the crop to Queensland, and asked for an opinion on what lines the Council should act. The returns indicated a unanimous vote in favour of a higher import duty on South African maize. Representations were then made to the Tariff Board urging an increased tariff on South African maize. The Minister for Trade and Customs and the Queensland members of the Federal Parliament have been asked to give their support to the Council's request, and have promised their assistance.

POTATOES.

A supply of excellent potatoes has been secured from Western Australia. These have been distributed amongst potato growers in bags of 7 lb. for seed purposes, on the condition that such growers returned to the Council 14 lb. for each 7 lb. received.

COTTON.

The Department of Agriculture and Stock has agreed to appoint an Entomologist to investigate cotton pests.

The supply of packs for the current season's crop is also receiving the attention of the Council.

ARROWROOT.

A pool was instituted at the request of growers, and is now in operation.

POULTRY.

After fully considering the suggestion of a Poultrymen's Committee for the formation of an Egg Pool from the business viewpoint, the Council recommended the establishment of a pool.

FRUIT.

At the request of the Council, the Chief Instructor in Fruit Culture (Mr. J. M. Ward) was appointed to act as Deputy of the Director of Fruit Culture (Mr. A. H. Benson, M.R.A.C.), and to assist in supervision.

Definite action, in the interests of fruitgrowers, has been taken in respect to the following matters:—

Appointment of Deputy Director of Fruit Culture (Mr. J. M. Ward).

Establishment and development of experimental plots in suitable localities.

Hail insurance.

Increase of entomological staff.

Legislation standardising sprays.

Co-operation with the New South Wales Government respecting border breeding grounds for fruit fly and eradication of the pest.

Establishment of a Stanthorpe and District Research Fellowship at the Queensland University, with the primary object of discovering economical means of combating the fruit fly pest.

Appointment of an entomologist (Mr. Hubert Jarvis) to specialise on the fruit fly problem.

[The appointment of an Entomologist (Mr. John L. Froggatt, B.Sc.) to investigate the Banana Beetle Borer Pest had previously been made by the Department of Agriculture.]

Special entomological investigation of the Banana Bunchy Top Disease and the Citrus Orange Bug.

To cope with the recommendations of the Council, the Entomological Staff and Fruit Inspectorial Staff have been largely increased.

Engagement of competent seasonal instructors in picking, grading, and packing.

Legislation for compulsory grading.

Amendment of the Fruit Cases Act.

Arrangements for supply of suitable case timber.

Experiments and inquiry relative to the utilisation of surplus fruits, and manufacture of by-products.

Consultation with Federal Authorities in respect to standard sizes of fruit containers.

Improvement of railway transport facilities.

Expedition of Queensland fruit consignments by rail and sea to Southern and Western markets.

Collection of reliable statistics.

Institution of the Tomato Pool at Stanthorpe at the request of growers.

Investigation and testing of systems of storage.

The carrying out of publicity campaigns which led largely to increased consumption of fruit.

Preliminaries towards more efficient marketing and distribution organisation.

THE SUGAR INDUSTRY.

Government and Council action in relation to the sugar industry has already been fully covered by the Journal, and a complete report of the proceedings of the delegation to Melbourne is set out elsewhere in this issue.

FERTILISERS.

The question of the supply, prices, and standard grades of fertilisers is under consideration in all its bearings. Official information on the elements of chemistry for the farm, dairy, and household has been disseminated by the Department of Agriculture and Stock.

WATER SUPPLY.

Water supply schemes have been prepared.

POOLS.

Legislation governing the formation of pools for farm produce.

SOLDIER SETTLEMENTS.

As the result of representations made by the Council, the Government came to the assistance of the soldier settlers at Pikedale, and agreed to make available to them amounts of £20 per acre to enable them to clear their blocks to the extent of 10 acres.

RURAL CREDIT SYSTEM.

A comprehensive scheme for the establishment of a rural credit system has been evolved, and is now receiving the consideration of a special committee of the Council.

CO-OPERATIVE COMPANIES.

The introduction of legislation to deal with the formation and activities of co-operative companies has been under consideration, and a scheme in this connection has also been evolved. This is now under consideration by the Administrative Committee of the Council.

TAXATION OF FODDER.

The Council has given consideration to the matter of the taxation of fodder, and, in view of its efforts to encourage conservation, has passed and conveyed to the proper authorities the following resolution:—

> "That in view of the particulars regarding the taxation of fodder furnished in recent letters from several branches of the Queensland Producers' Association, and moreover, as the Council is now actively engaged in urging farmers to conserve fodder, it is recommended to the State and Federal Income Tax Commissioners that where fodder is stacked on a farm it be not subject to income tax until it has either been sold or converted into cash through feeding to stock."

CONCLUSION.

The Queensland Primary Producers' Organisation scheme is probably one of the finest that has ever been brought into being in any country for the betterment of the man on the land, and it is gratifying to know that the farmers are so generally realising its potentialities and their responsibilities. The power for good of this organisation is limited only by the extent to which the producers of Queensland are willing to support and make use of it, and the extent to which they are prepared in the due spirit of co-operation to help each other by means of the scheme.

Science Notes.

By EDMUND JARVIS, Entomologist, Bureau of Sugar Experiment Stations.

ON THE HABITS AND COLOURATION OF QUEENSLAND RUTELLIDÆ.

The beetles figured on the accompanying plate include two or three of our most beautiful species of *Coleoptera*.

My feelings of admiration for the so-called "gold-beetle" (Fig. 3) were first awakened about thirty-two years ago, in Victoria, by Mr. Charles French, F.L.S., who showed me a fine series of fifty or more pinned specimens.

This insect has a very artificial appearance, seeming, at first glance, to be made literally of polished metal.

It was, perhaps, just such a beetle that Edgar Allan Poe had in mind when penning that familiar tale of mystery entitled, "The Gold Bug."

A closely related, but slightly larger cockchafer (*A. mastersi* Macl.), of a lovely metallic greenish-gold colour is considered by growers at Macknade and Ingham to be a pest of sugar-cane.

The grubs of *Anoplognathus frenchi*, however, subsist on the roots of various native plants, but although of little or no economic interest at present may possibly be found, later on, to attack cane in those localities where the insect is known to occur freely.

The beetles are reported to feed on the foliage of a wild *Hibiscus* with large yellow flowers, that usually grows in wet situations, and is a common tree close to Cairns and at Freshwater.

In the Herbert River district it is called "Cotton-tree," and said to be a favourite food-plant of our grey-back beetle.

It may interest readers to know that the bright colours of Rutellidæ and of many other coleoptera possessing brilliant shades of blue, green, violet, &c., are due in part to the surface of the elytra or wing-cases being formed of innumerable microscopical concavities or wrinkles. In *A. punctulatus* and *smaragdinus* (figs. 4 and 6) each of these countless punctures is surrounded by striæ, and forms the centre of a four to six-sided figure.

In the case of *frenchi* the colour appears to be of a chemico-physical nature, being due to diffraction of the rays of light falling on such surface irregularities, combined with an underlying reflecting pigment. Thus, if a specimen be left for a month or two in alcohol or formalin this pigment is destroyed, the beetle becoming of a uniform light-brown colour; whereas, if killed and dried without delay the golden splendour of the insect is permanently retained, owing to this underlying pigment, which is secreted by the hypodermal cells, being enclosed in air-tight sacs.

Anomala Australasiæ, Blackb. (Fig. 1).

The egg and early larval stages of this species—not hitherto published in our bulletins—were worked out by the writer during 1918-19, and are of scientific interest.

A beetle captured 28th November, and confined at once in a breeding-cage, was found when examined nine days later to have laid 18 eggs. These varied in size, so were probably deposited on different days. They hatched on 17th December (nineteen days after capture of the beetle); and a couple of months later (17th February) several third-stage grubs were found.

Other beetles caged on 5th December produced eggs six days later, which hatched on 20th December (fifteen days after capture of beetles).

By about the middle of April nearly all the grubs bred during the course of these investigations had moulted into stage three, and early in May were commencing to pupate.

Description of Egg.—Nearly spherical, smooth, milky-white, and measuring 2.25 mm. longest axis; ten eggs in a straight line, touching end to end, = 22.50 mm. These eggs are laid separately in the soil, no chamber or enlargement being made to allow for swelling.

Description of Newly Hatched Larva, before Feeding.—Dirty white, yellowish-brown towards and on anal-segment. Head, legs, and antennæ light-yellow, trophi reddish-brown. Body sprinkled with golden hairs. When inactive, assumes a doubled-up posture, ball-like in form, but is able to stretch to fullest length and crawl quickly on its venter. A day or two after hatching the body darkens to bluish-brown.

Description of First Larval Instar.—General colour bluish-grey; head pale fulvous, width of same 2.70 mm. Length, doubled-up position, 9 mm., length fully extended, 16 mm. Legs whitish-yellow. Disposition of body hairs, very similar to stages two and three. Anal path on posterior ventral surface, distinct, and defined by short setæ.

Description of Second Larval Instar.—General colouration pale bluish-yellow, somewhat shining. Head, legs, and spiracles fulvous; mandibles and labrum castaneous, the former darker towards tips; width of head 4 mm. Peritremes very open, and with exception of first thoracic equi-sized. Body clothed with reddish-brown hairs, rather long, and sparingly distributed on thoracic and first abdominal segments. Posterior area of venter of anal segment with numerous short, recurved, scattered hairs, and exceptionally with no indication of an anal path. Length, in doubled-up position 15.50 mm. *Note.*—When lying on its side in this position the grub assumes an almost circular form. Length, when fully extended 28 mm.; widest transverse measurement 7.50 mm.

The colour of this beetle is dark bronze-green, more or less clouded in certain lights with lustrous shades of pink.

It was first recorded as being a cane pest by the writer in Bulletin No. 3 of this Experiment Station, 1916, p. 40.

Repsimus Æneus, Fabr. (Fig. 2).

The general ground colour of this beautiful beetle is chrome-green, most specimens, however, being flushed with coppery or steely-blue tints, while the reflected high lights appear a lovely pale golden-green.

It may be identified immediately by the structure of its hind legs, which are longer and noticeably thicker than the others.

The writer observed several of these insects in January, 1915, flying around a stunted eucalpt on the sides of Mount Pyramid.

One of them had been attacked and killed by a pentatomid bug (*Amyotea hamata Walk.*) which was seen resting on a gum-leaf supporting the weight of the beetle in mid air at the end of its proboscis, while engaged in sucking the juices of the victim.

According to Froggatt, these beetles are common about Sydney, where they are found clinging to low bushes.

Anoplognathus Punctulatus, Oliff., and A. Smaragdinus, Ohaus. (Figs. 4, 6).

These two insects, as seen by the plate, differ noticeably in form, and although both of a rich uniform green—an almost pure oxide of chromium—the shade of colour in *smaragdinus* is lightened with more yellow, producing a lustrous effect not present in *punctulatus*.

The pygidium, and under surface of the latter insect, including the legs, is dark coppery-brown with light greenish-gold reflections; while *smaragdinus* is green below, with lighter golden-brown legs, and its pygidium is the same colour as the elytra.

Neither of these beetles are known to be of economic importance, or have, up to the present, been recorded from canefields.

Anoplostethus Laetus, R. & J. (Figs. 7, 8, 9).

This species, which is one of our most lovely beetles, is remarkable in possessing distinct varieties, three of which are shown in figs. 7, 8, and 9.

The green specimens are reported to be about four times as plentiful as the other varieties, which usually occur in about equal proportions. Change of colour in perfectly developed insects is believed by Krukenberg to result from change of food, and can be explained by alteration of the pigment through heat and light. Such alteration, however, is generally effected gradually, so would scarcely apply in the present instance, unless on the supposition that an interval of a week or more may elapse between the appearance of early specimens and those constituting a larger and later emergence.

The colour in this species is evidently of a less enduring quality than those characterising the beetles already alluded to.

The beautiful glossy alizarin-green variety does not fade appreciably in dried specimens, whereas the red form, the colour of which in life resembles that shown in fig. 8, changes to brown madder, and the pinkish opalescent violet variety darkens to a warm monochrome after death. In a fourth and much rarer orange-yellow variety of this beetle the colour appears to be of a still more fugitive nature.

A second species of this genus, *A. opalinus*, is recorded by Froggatt as being of a beautiful pale opaline-green colour, and peculiar to Western Australia.

"Christmas Beetle" (Anoplognathus Boisduvali, Boisd.), Fig. 5.

This insect was mentioned by the writer in 1915 (Bull. No. 3, p. 40) as occurring commonly among cane roots in both light and heavy classes of soil, but showing a preference for sandy loams.

Its favourite food-plant appears to be Eucalyptus platyphylla, a tree with white, smooth bark, and having, as denoted by its specific title, very broad leaves. It is not uncommon to find suckers springing from stumps of this gum-tree with leaves eight to ten inches in length and six to eight in width.

The general colouration of this beetle when alive is pale creamy-grey, with a distinct silvery lustre and faint green and pink iridescence. The silvery sheen, however, fades after death, being replaced by pink-ochraceous, as indicated in fig. 5, drawn from a dried specimen. Each elytron has about ten rows of coarse punctures, half of which are straight and clouded in places with smoky-brown, all ten rows enclosing numerous small brown punctures. The suture is green, while the outer edges of elytra are bordered with golden-brown. Head, prothorax, and scutellum metallic greenish-gold, finely punctulate. Pygidium bright green edged with blue. Ventral area irridescent coppery-green; thorax, legs, and anterior margins of abdominal segments more or less clothed with short white hairs. Tibiæ and tarsi purple.

This species ranks about third in economic importance amongst our beetles attacking sugar-cane.

PLATE NO. 85.

DESCRIPTION OF PLATE.

SOME NORTH QUEENSLAND RUTELLIDÆ; INCLUDING BEETLES WHICH ATTACK SUGAR CANE (All figures life-size).

Fig. 1. *Anomala australasiæ* Blackb.

Fig. 2. *Repsimus æneus* Fabr.

Fig. 3. *Anoplognathus frenchi.*

Fig. 4. *Anoplognathus punctulatus* Oll.

Fig. 5. *Anoplognathus boisduvali* Boisd.

Fig. 6. *Anoplognathus smaragdinus* Ohaus.

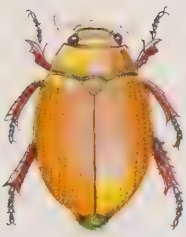
Figs. 7, 8, 9. *Anoplostethus lætus* R. & J. (three varieties).

1

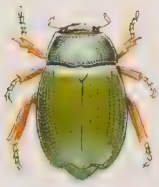
2

3

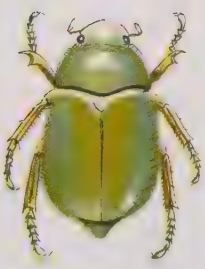
4



5

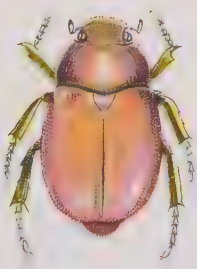


6



7

8



9

E. Jarvis

TREATMENT FOR SMALL WORMS IN HORSES

(SCLEROSTOMA TETRACANTHUM).

This is a small thread-like worm, about half an inch long, found chiefly in the large bowel in great numbers. The embryos encyst themselves beneath the mucous membrane. The countless wounds which the worms make in the bowel and the irritation caused by the encysted larvæ give rise to enteritis, &c. There is usually associated with this worm another known as the *Sclerostoma equinum*. This worm is about 1¼ inch to 1½ inch long, grey or reddish-grey in colour, with a round knobbish head, and tapering to the tail end. The embryos wander into the blood vessels, causing obstructions giving rise to grave complications.

Treatment.—All suspected animals should be purged by administering a dose of physic, such as 5 to 6 drachms of Powdered Barbados Aloes with one drachm of Powdered Ginger, given as a drench in a pint of thin gruel, or made into a ball with a little soft soap. After the action of the purgative has ceased they should be given every day, about one hour before their morning feed, the following powder mixed in a couple of handfulls of damped food:—

Antimony Tartrate	2 drachms
Powdered Sulphate of Iron	1 drachm
Powdered Gentian	2 drachms
Powdered Aniseed	3 drachms

After six doses they should be given a second active purgative. For the smaller horses and ponies not more than 5 drachms of Aloes and 1 drachm Antimony Tartrate should be given. During the treatment the animals should be kept yarded to prevent the contamination of pastures by excreta, which should be gathered up and burnt and the ground dressed with common salt or quicklime. As infested animals cannot by one course of vermifuges be divested of the larvæ in the cysts and blood vessels, they should be treated at intervals of two or three months. More important than medication is the exclusion of embryos from food and water.

Wherever the Sclerostoma have secured a local habitat the land should be put under a rotation of crops, to be laid down in grass again after four or five years; the Sclerostoma ova will by this time have hatched out and died a natural death. Where this is impracticable change the horses to other pastures and depasture the infested land for several years by cattle or sheep, which do not harbour the Sclerostoma. In all cases it must be provided that no drainage can come from infested pastures to the clean pastures. Rock salt left in the paddocks for the horses to lick will greatly minimise the chances of infestation.—Major A. H. Cory, M.R.C.V.S.

THE COTTON BEETLE—A GROWER'S EXPERIENCE.

Mr. T. Winterton, of Lismore, New South Wales, regards the beetle that attacks the cotton plant as a minor pest, seeing that it can be easily and effectively dealt with (reports the Sydney "Daily Telegraph"). His half-acre crop looked very promising three weeks ago, when the plants were attacked by swarms of beetles. He tried dusting with lime, and arsenate of lead spray. "These," he says, "seemed to act like sauce for them, and it looked as if they would eat up everything except the stalks. I then got an old broom handle, bound a big wad of woollen cloth round the end with wire, and soaked it with kerosene. When it was dark I lighted it, and, walking slowly through the cotton, taking two rows at a time, I shook the plants. The beetles flew in myriads to the light, and fell in heaps with their wings and legs burnt. Next morning one could pick them up in handfuls in places. I went over the field again the next night, and destroyed nearly all of them. A few days after I gave them another run through, but only found one here and there, and now they are quite free. If I had known this method at the start they could all have been settled the first night, and great damage prevented. It took me about one and a-half hours to go over half an acre."

Mr. Winterton adds: It may interest your readers to know I picked some cotton to-day from plants the seed of which was planted on 6th October, or not quite four months' growing. I noticed the beetles attacked the most forward cotton first; that planted last, which was only small, was scarcely touched.

PLATE 86.—AUSTRALIAN NATIVES' ASSOCIATION EXHIBITION, MELBOURNE, 1923.

SHOW DATES FOR 1923.

Herberton, 2nd and 3rd April.
Pittsworth, 4th April.
Chinchilla, 10th and 11th April.
Goondiwindi, 10th and 11th April.
Oakey, 11th and 12th April.
Toowoomba, 17th to 19th April.
Kingaroy, 26th and 27th April.
Maleny, 26th and 27th April.
Miriam Vale, 26th and 27th April.
Blackall, 9th and 10th May.
Boonah, 9th and 10th May.
Taroom, 1st and 2nd May.
Charleville, 1st and 2nd May.
Dalby, 2nd and 3rd May.
Nanango, 3rd and 4th May.
Atherton, 16th and 17th May.
Wondai, 9th and 10th May.
Roma, 15th and 16th May.
Emerald, 16th and 17th May.
Murgon, 17th and 18th May.
Wallumbilla, 22nd and 23rd May.
Hughenden, 22nd and 23rd May.
Ipswich, 23rd and 24th May.
Kilkivan, 23rd and 24th May.
Springsure, 23rd and 24th May.
Childers, 24th and 25th May.
Beaudesert, 29th and 30th May.
Maryborough, 29th, 30th, and 31st May, and 1st June.
Buderim, 1st and 2nd June.
Bundaberg, 1st and 4th June.
Marburg, 2nd and 4th June.
Mackay, 4th and 7th June.
Esk, 6th and 7th June.
Cairns, 6th and 7th June.
Gin Gin, 6th to 8th June.
Gladstone, 12th and 13th June.
Gayndah, 12th and 14th June.
Toogoolawah, 13th and 14th June.
Mundubbera, 13th and 15th June.
Mount Larcom, 15th and 16th June.
Biggenden, 20th and 21st June.
Rockhampton, 21st to 23rd June.
Lowood, 22nd and 23rd June.
Kilcoy, 28th and 29th June.
Ithaca, 29th and 30th June.
Bowen, 4th and 5th July.
Gatton, 11th and 12th July.
Charters Towers, 11th and 12th July
Woodford, 12th and 13th July.
Wellington Point, 14th July.
Townsville, 18th and 19th July.
Caboolture, 19th and 20th July.
Mount Gravatt, 21st July.
Barcaldine, 24th and 25th July.
Nambour, 25th and 26th July.
Rosewood, 25th and 26th July.
Maroochy, 25th and 26th July.
Pine Rivers, 27th and 28th July.
Crow's Nest, 31st July and 1st August.
Sandgate, 3rd and 4th August.
Brisbane Royal National, 6th to 11th August.
Belmont, 18th August.
Charters Towers, 22nd and 23rd August.
Coorparoo, 25th August.
Gympie, 29th and 30th August.
Wynnum, 31st August and 1st September.
Imbil, 5th and 6th September.
Zillmere, 8th September.
Laidley, 13th and 14th September.
Beenleigh, 20th and 21st September.
Ingham, 21st and 22nd September.
Rocklea, 22nd September.
Toombul, 28th and 29th September.
Kenilworth, 4th October.
Esk Bushmen's Carnival, 17th and 18th October.
Nerang, 19th October.
Ascot, 24th October.
Malanda, 25th and 26th October.
Pomona, 21st and 22nd November.
Millaa Millaa, 23rd and 24th November.

TREATMENT FOR MANGE IN HORSES.

The affected parts should be well washed with warm water and soda. After the animal is dry, the following dressing should be applied once daily for three days:—

Sulphur	4 ounces
Creolin	4 drachms
Linseed oil	1 pint

Allow the dressing to remain on for three days after the last application, then thoroughly wash off and repeat dressing after an interval of a week.—Major A. H. Cory, M.R.C.V.S.

Photo.: A. Blakey, Junr.]

PLATE 87.—OVER BAROON POCKET, NEAR MONTVILLE.

Photo.: A. Blakey, Junr.]

PLATE 88.—ON THE ROAD FROM BUDERIM TO THE SEA.

General Notes.

To Correspondents.

Correspondents seeking information through the Journal should address all communications to the Under Secretary, Department of Agriculture and Stock, Brisbane. Letters on official matters should not be addressed personally to the Editor, who may be away from Headquarters on official duty at the time of their delivery. To ensure prompt acknowledgment all technical inquiries should be directed, as suggested, to the Under Secretary.

To Subscribers.

In future the cross indicating the expiry of the term covered by subscriptions will be placed in the space delineated on the first page of the Journal. It is suggested that when remitting subscriptions, farmer subscribers should send, say, anything up to five years' subscription (5s. to cover postage). This would simplify the work of forwarding, save time and expense of renewing stencilled mailing lists, and ensure continuity of despatch. It so often happens that when a subscriber's term expires the non-receipt of the Journal is the only reminder that his subscription is no longer current. In the meantime his name has been removed from the mailing list. When the renewal, the only evidence of a subscriber's desire to continue, is received, a fresh stencil has to be cut, and as this costs something over 1d. the expense in the aggregate is considerable. The Journal, of course, is free to farmers, and the annual charge of one shilling merely covers cost of postage.

Pools—Victorian Farmers Looking to Queensland.

A deputation of Victorian onion growers last week urged the Government to form a compulsory pool to take over the unsold balance of the crop. The growers said the cost of production was £6 per ton, including labour, and many of them were receiving only £2 5s. per ton. It was suggested that the pool should fix the selling price at £7 per ton, growers to be allowed £3 at once and £4 held in hand for expenses and reserves. The Minister for Agriculture (Victoria) said that a pool was out of the question, as it was against the policy of his Government. He advised the formation of a growers' association, and a voluntary pool. The Victorian producers are not yet educated up to the benefits of the pool system—which is merely co-operative marketing —and there is little or no recognition of the right of the man on the land to get a paying price for his products. The Queensland Butter Pool has been most bitterly attacked in Melbourne by men who were disappointed at not getting our butter at their own price, and also by honest theorists who believe that producers should muddle along in the bad old way. The dairy farmers in Victoria are asking why they have no organisation such as the Queensland farmers have, and the onion growers will have to do some hard thinking also. In Queensland the primary producers are quickly getting out of the method of throwing their stuff on to the market, and letting it take its chance, and it probably will surprise Victorians to know that produce merchants are giving very cordial support to the new system.—"The Queenslander."

Anniversary of a Notable Agricultural Advance A Milbong Celebration.

Messrs. S. Gordon (Secretary) and D. J. Casey (Chairman), of the Milbong Local Producers' Association, write under date 26th March:—

"To the Minister for Agriculture and Stock, Hon. W. N. Gillies.

"At a commemorative social and banquet held at Milbong on the 23rd instant, at which were represented various officials of other branches of the Producers' Association, and before a large and representative gathering of farmers, the following resolution was read and carried amidst acclamation:—

"We, farmers of Milbong and adjacent districts, meeting to celebrate the first anniversary of the birth of the Queensland Producers' Association, desire to express our gratitude to the Premier of the State and to the Minister for Agriculture for the creation of the Queensland Producers' Association, and to the Queensland Government for placing upon the statutes the Primary Producers' Organisation Act and other measures of inestimable benefit to producers.

"As evidence of our gratitude we celebrate this occasion, hoping thereby that it may stimulate a greater interest in our movement and demonstrate our appreciation of the Government's efforts to place our industry on a more remunerative plane."

Australia as a Market for Manufactured Cotton Goods.

The export of cotton manufactures from the United Kingdom during January last amounted to 339,117,400 square yards of material, of which Australia received 22,030,300 square yards. Two other countries only exceeded that quantity, China (including Hong Kong) received thirty-five and a-half million square yards; and India (excluding Burmah) eighty-one million square yards.

Protection of Native Bears and Opossums.

A Proclamation has been issued under "*The Animals and Birds Act of* 1921," the effect of which is that there will be no open season for opossums and native bears this year.

Standing Committees, Council of Agriculture.

In accordance with the provisions of "*The Primary Producers' Organisation Act of* 1922," the following Standing Committees of the Council of Agriculture have been formed:—

Administrative.—Messrs. G. H. Pritchard, J. D. Story, E. Graham, W. Ranger, W. J. Short, J. W. Davidson, and G. Burton.

Publicity.—Messrs. G. H. Pritchard, J. D. Story, E. Graham, W. Ranger, W. J. Short, J. W. Davidson, and G. Burton. Associate Member—Mr. J. F. F. Reid.

Dairying.—Messrs. A. Evans, E. Graham, J. Hardcastle, T. F. Plunkett, R. Swan, J. T. Tatnell, and J. T. Tod.

Fruit.—Messrs. W. Biggs, T. H. Brown, W. Ranger, F. M. Ruskin, and C. Bateman.

Sugar.—Messrs. W. G. Batchler, W. Biggs, T. A. Powell, G. H. Pritchard, and W. J. Short.

Transport.—Messrs. W. G. Batchler, J. W. Davidson, A. Evans, A. McKinlay, W. Ranger, J. H. Sigley, and R. Swan.

General Agriculture.—Messrs. C. Bateman, R. K. Boyd, G. Burton, T. C. Hayes, A. McKinlay, H. C. Quodling, and J. H. Sigley.

The American Boll Weevil—Arsenic Preventive.

The National Bank of Commerce in New York, in its "Commerce Monthly," deals with the question of fighting the Mexican cotton boll weevil by the use of calcium arsenate. The paper says that 97 per cent. of the United States cotton belt is infested, and the demand for the calcium arsenate bids fair to outrun the available supply of arsenic. Further, it is said that experiments conducted by the United States Department of Agriculture and by independent agencies in recent years indicate that the most effective means of combating the weevil so far developed is the use of calcium arsenate, which is dusted upon the cotton plant at night. The dew becomes impregnated with arsenic, and the weevils are poisoned by drinking it. Calcium arsenate, it is said, was first used to poison the boll weevil in 1919, and now about 10 per cent. of the cotton acreage is treated. Because of the success of experiments so far made, a much more extensive application is planned for 1923. The amount of calcium arsenate required varies according to conditions, but 30 lb. per acre may be taken as a moderate allowance. This is distributed in a series of applications. The total cotton acreage in 1922 was 33,742,000 acres, so that if applications could be made on all fields 500,000 tons of calcium arsenate would be required, containing approximately 200,000 tons of white arsenic. Areas of marginal production in many cases would scarcely support the cost of application, while everywhere the specific used will at best fall far short of this quantity. Conditions for successful application are exacting, and in many the psychological factor of inertia must be reckoned with. But when all these deductions have been made, it is evident that there is a large potential demand for calcium arsenate to combat the boll weevil. The amount actually used will depend upon the available supply and the price in relation to the price of cotton. United States output of white arsenic, the form in which practically all primary arsenic is recovered in this country, and which is the basis for the manufacture of other compounds, increased from 3,141 tons in 1912, the year of largest pre-war output, to 11,502 tons in 1920, and production in 1922 fell only a little short of 11,000 tons. Consumption in 1920 was estimated at 14,000 to 16,000 tons, imports supplying 3,740 tons, and present demand is believed to be about 12,000 tons. While the United States is the largest producer of arsenic, it is also the largest consumer, and at no time has domestic output been sufficient to satisfy domestic requirements.

Photo. : A. Blakey, Junr.]

Plate 89.—On the Road to the Sea from Buderim Mountain.

Photo. : A. Blakey, Junr.]

Plate 90.—A Montville Orchard.

American Cotton Conditions.

Information received from America by Mr. W. G. Wells (Cotton Adviser, Department of Agriculture and Stock) goes to show that there is a wide range of opinion among traders and crop experts in that country as to the immediate course of prices for cotton, but the latter group have indicated a firm belief in higher figures being ultimately obtained. Crop prospects in the south of America, it is stated, were not growing any brighter, and it was more than doubtful whether the cotton States would be able, in 1923, to expand their output. A labour supply inadequate to cultivate the acreage which planters hope to sow with cotton this year seems inevitable. There had been a lack of rain in some parts where it was badly needed, and in certain localities the winter weather has been such as to make the boll weevil an even greater menace than in the past. This danger had been augmented by the shortage of efficacious insecticides. It was regarded as significant that English spinners were buying cotton from the United States as fast as they could accumulate the raw staple at present prices. This policy was determined upon shortly after France entered the Ruhr, and the acceptance of the American terms for the payment of the British debt to the United States had confirmed the spinners in their attitude. They were taking steps to maintain themselves in the cotton cloth markets of the world throughout the coming year by providing for the future requirements as far as possible. On 1st February one of the foremost cotton experts of the southern part of America predicted a price of 35 cents per lb. of cotton (roughly 1s. 5½d.) before the new American crop came on the market at the end of their summer. He also declared that the mills would have to scurry round for raw cotton in a manner not known since 1910 in order to keep their spindles at work.

Departmental Appointments.

Constable Blake has been appointed an inspector of slaughter-houses.

D. J. Binnie, the supervisor of the Cecil Plains Soldier Settlement, has been appointed an Acting Inspector of Stock.

William Rowlands, fruit packing instructor, has been made an inspector under the Diseases in Plants Act.

To Queensland Cotton-growers.

Growers, until further advised, must rail their cotton as under:—From all stations south of Ambrose (N. C. Line), excepting stations from Lakeside westwards on the Mundubbera Branch and from Blaxland westwards on the Western Line, to Whinstanes. Cotton from North Queensland to be shipped to Brisbane; from all stations west of Blaxland on the Western Line and Branch lines to Dalby; from all stations on the Gayndah-Mundubbera Branch west of Lakeside to Gayndah; from all stations between Ambrose (N. C. Line), inclusive, and Mackay, including stations on the Central Line and Branches, but not including stations on the Dawson Valley Branch (Mount Morgan-Baralaba), to Glenmore (Rockhampton); from all stations on the Dawson Valley Branch (Mount Morgan-Baralaba), to Wowan.

Marks.—Growers should brand all packages with their full name.

Advices from Growers.—It is most important that growers, when forwarding cotton, *send an advice to the ginnery to which their cotton has been consigned.* If growers consign cotton and fail to advise the ginnery, *payment will be delayed.* Therefore, always advise the ginnery when forwarding cotton, and post the advice so that it will reach the ginnery before or at the same time as the cotton.

Ratoon Cotton.—Packages containing ratoon cotton must be branded in 2-inch letters—"Ratoon." Ratoon cotton will only be received at Rockhampton and Whinstanes Ginneries, and growers are requested to rail as under:—

From all stations south of Ambrose (N. C. Line) to Whinstanes; from all stations north of Ambrose (N. C. Line) to Rockhampton (Quay street).

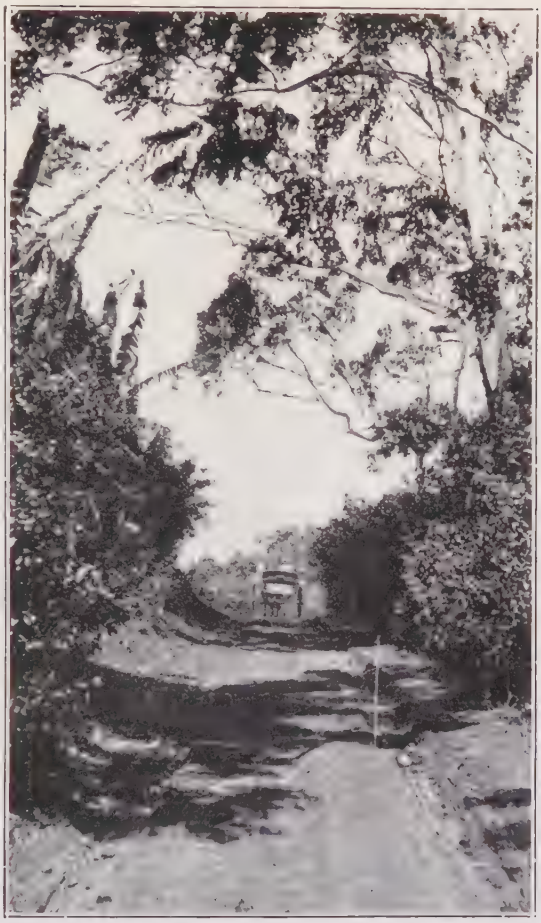


Photo.: A. Blakey, Junr.]

Plate 91.—The Coast Road, Buderim.

Photo.: A. Blakey, Junr.]

Plate 92.—Typical North Coast Dairy Lands, below Blackall Range, near Montville.

America Interested in Queensland Agricultural Organisation—The Need for Marketing Machinery—A Minnesota View.

Mr. J. H. Hay, Deputy Commissioner, Department of Agriculture, State of Minnesota, writing from the State Capitol, Saint Paul, under date 22nd January, 1923, says:—

"I beg to acknowledge receipt of your kind favour of 14th December, also a number of bulletins and other agricultural information, under separate cover.

"All of this material is of decided value at this time. I refer to the fact that the farmers of the United States are giving serious consideration to the organisation of efficient marketing machinery through which to move their commodities to market. No little interest prevails in our State and in neighbouring States, with reference to the experiences of Australia and New Zealand in the matter of the marketing of their grain. There have been built up in our country strong organisations of middlemen who take heavy toll of the grain farmer. These organisations are exceedingly efficient, have large financial interests which support them, and have secured a tremendous hold upon the control of the marketing processes. In fact, they have exclusive control of the domestic and foreign marketing of the grains of this country. It is the purpose and determination of the farmers of the United States finally to secure control of their own marketing processes, and in addition an ample amount of finance with which to hold and move the crop to mills and export.

"I desire to express my pleasure and gratitude for the kindness you have exhibited in so promptly forwarding to me the information indicated above. We should be pleased to be placed on your mailing list for other agricultural information which your Department may issue in the future. I assure you that it will be our pleasure to reciprocate in any manner which you may indicate to us."

American Appreciation.

Mr. Hugh P. Baker, F.R.G.S., of the American Paper and Pulp Association, New York City, writes:—

"The 'Queensland Agricultural Journal' is being received regularly, and is very much appreciated. While my chief interest as a forester is in the forest situation in Queensland, yet, having been connected with several of our Agricultural Colleges in this country, I am very much interested in other matter in the Journal.

"Attached to this letter I am sending several of our recent Press Bulletins on the forest conditions in this country. Some of this matter may be of interest to you.

"If at any time we can give you information as to forest conditions in this country I wish you would feel free to come at us."

South African Farmers Seek Information on the Queensland Scheme for Complete Agricultural Organisation.

The Executive of the Transvaal Agricultural Union (Transvaalse Landbouw Unie), Pretoria, writes:—

"A copy of your 'Agricultural Journal' for August, 1922, has fallen into our hands, and we are much interested to note from page 5 and the accompanying diagram that your agricultural industry is organising on almost similar lines to the Transvaal Agricultural Union.

"Whilst our Union, however, is entirely self-supporting, your organisation would appear to be under Government control, or at any rate support and reorganised by your Government.

"Our interest is so great that we would esteem it a great favour if you could send us the fullest particulars of your scheme:—Constitutional, propaganda, membership, finances, &c.

"Another point of interest to us is your method of handling Crop Reports.

"Then, your notes on your 'Primary Producers' Organisation Bill' and 'Agricultural Education Bill' have caught our eye, and we would be pleased to have copies of the Bills. In fact, any information or publications you can send us will be appreciated.

"We have recently started our own official organ, 'The Farmers' Gazette,' a copy of which will be sent to you regularly, and in the course of the next mail we hope to send you a photo. of our organisation diagram.

"A copy of our amended Constitution is enclosed herewith."

Mill Offals—An Alleged Anomaly.

A deputation representing the Warwick Farmers' Milling Company was introduced to the Minister for Agriculture (Hon. W. N. Gillies) recently by Mr. F. T. Brennan, M.L.A. The deputation consisted of Messrs. Hooper and Kirkegaard, two of the Directors of the Warwick Farmers' Milling Company. The deputation explained to the Minister the existence of a certain anomaly regarding rebate on bran and pollard, and stated that the Wheat Board had not seen its way to meet them in their request. The Minister pointed out that he thought the deputation might again interview the Wheat Board, and he asked Mr. Brennan to represent him at such an interview. Messrs. Hooper and Kirkegaard agreed to the suggestion.

Council of Agriculture.

The new Council of Agriculture (as from 23rd March, 1923, to 30th June, 1924) has been constituted as follows:—Hon. W. N. Gillies, Minister for Agriculture and Stock, President; Messrs. J. W. Davidson (Commissioner for Railways), E. Graham (Director of Dairying), H. C. Quodling (Director of Agriculture), W. J. J. Short (General Manager, Bureau of Central Sugar Mills), and J. D. Story (Public Service Commissioner). Representatives of district councils of agriculture (districts as per Order in Council of 21st December, 1922): No. 1, Mr. G. H. Pritchard; No. 2, Mr. W. B. Biggs; No. 3, Mr. T. A. Powell; No. 4, Mr. A. Evans; No. 5, Mr. W. G. Batchler; No. 6, Mr. R. L. Boyd; No. 7, Mr. J. T. Tatnell; No. 8, Mr. J. H. Sigley; No. 9, Mr. T. H. Brown; No. 10, Mr. C. Bateman; No. 11, Mr. F. M. Ruskin; No. 12, Mr. T. F. Plunkett; No. 13, Mr. J. Hardcastle; No. 14, Mr. T. C. Hayes; No. 15, Mr. G. Burton; No. 16, Mr. J. T. Todd; No. 17, Mr. W. Ranger; No. 18, Mr. A. McKinlay; No. 19, Mr. R. Swan.

Answers to Correspondents.

Staggers.

G.O'S. (Ingham)—The Poultry Instructor, Mr. J. Beard, advises:—

It was not mentioned if the specimen were the inside of a fowl or a duck. Another omission was a description of the nature, colour, and substance of the excreta—one of our best guides to diagnosis. The age of the ducks was also omitted, but it is assumed they were young ones, and were affected with staggers. This is a common disease in this State, and is usually attributed to bad feeding, dirty water, insufficient shade, &c. In many instances, however, outbreaks of staggers occur in yards where everything is scrupulously clean, and the ducklings properly fed and cared for. It is purely an infantile complaint, and only attacks ducklings during the hot summer months. So far, there is no known cure once the ducklings become affected, they being too young for medical treatment. Staggers is a disease which breeders are alone responsible for, and which may be easily avoided if due care is paid to the breeding stock, and proper attention given to the ducklings when hatched. Another thing to avoid—never breed from muscovies under two years old.

With reference to the two Leghorn fowls, there is no data to work on.

Poultry Feeding.

J.G.T. (Mundubbera)—

The Poultry Instructor, Mr. J. Beard, advises:—Best results are obtained by feeding moist mash in mornings and grain in the evening, with green stuff of some kind at midday. There is no set rule as regards the quantity of feed a fowl will eat. They should be given as much as they will eat and no more. After a couple of weeks you will learn just what quantity they require. The mash should consist of 2 parts pollard and 1 part bran, with 2 lb. oilcake to each 100 fowls, the oilcake to be scalded overnight, given every second morning, and meat, ½ oz. per bird each morning oilcake is not used. In lieu of meat, use 5 per cent desiccated meat, which means 5 lb. to every 100 lb. of mash; the safest way is to mix 100 mashes, add 5 lb. desiccated meat, and 22 oz. fine table salt. Mix all well together, and use as required. Evening, feed wheat, and a little maize once a week by way of a change. Always have available in a container a supply of grit, shell, and charcoal, and clean water.

Seed Cotton Sample.

A.J.B. (Toowong)—The Australian Cotton Growing Association comments on your sample as follows:—

This is a strong rather coarse lint, having a fibre length of 1.7/16 inch and being fairly even. This cotton corresponds to "Full Rough Peruvian," and there would probably be some difficulty in marketing same, as it is a speciality cotton, and not used in the manufacture of the ordinary cotton materials.

Dip Mixture—"Quinine" Plant.

H.T. (Boonah)—Mr. H. C. Quodling (Director of Agriculture) advises:—

The Department does not make a practice of commenting publicly as to the efficacy or otherwise of compounds of proprietary cattle dip mixtures. Our practice is to recommend a well-known formula for the preparation of an arsenical mixture for the destruction of timber.

The bitter bark you refer to is apparently what is known in many parts of the State as "Quinine." This is a most difficult plant to eradicate, and it is questionable whether the cutting off of the bushes close to the ground and swabbing the butts well with a poison will be efficacious, as the plants have an extensive root system, shoots from which are readily thrown out. In some localities where a heavy plough can be used it is considered more satisfactory to tear up the ground infested with the quinine roots instead of attempting to poison in the manner suggested. April and May should be the best months to poison should you decide to give this latter method a trial.

Egg Packing.

T. SEYMOUR (Hawkwood) writes:—

"The article 'Californian Methods of Poultry Raising and Marketing—I.,' printed in the last issue of the Journal I read with much pleasure, and one item which I took particular notice of was that, 'The farmer buys egg-boxes holding thirty dozen from the co-operative society.' I would be pleased if you could describe that particular box in the Journal, as to the shape, size, and packing contents, or method of packing. Not only myself but many other farmers, I am sure, would be pleased to see the box described."

A description and design of an egg container suitable for the Australian trade is being prepared for the Journal, and will be published shortly.

"Ropiness" in Bread.

R.T.C. (Tarvano)—

The following extract is from Jago's "Technology of Bread Making," which the Agricultural Chemist (Mr. Brünnich) states will give you the information you require:—

Occurrence.—During hot weather bread is liable to an outbreak of the disease called "rope." Its first manifestations usually occur in from twelve to forty-eight hours after the bread leaves the oven.

Nature and Symptoms.—The bread acquires a faint sickly odour, and the crumb is infected with brownish spots, which are larger the nearer the centre of the loaf. With the progress of the disease, the spots spread and the interior of the loaf becomes moist and sticky. The infected portions may be drawn out into long threads, and hence the name of rope. With the continuation of the disease, the crumb of the bread breaks down into a molasses-like mass, and emits an exceedingly disagreeable valerian-like odour.

Susceptibility.—Breads containing bran and germ, such as whole-meal, certain patent breads, and rye bread, are all particularly susceptible. Of those made from white flour, the grades composed of the heart of the endosperm—*i.e.*, the best patent flours—are less likely to produce rope than the lower grade flours, which are more or less contaminated with dust and bran fragments.

Origin.—All modern writers agree in ascribing rope to bacterial activity.

Conclusions.—Elevated temperature appears to be absolutely necessary to the development of ropiness in bread. Even when the bacillus is present in large numbers, moisture alone, when the temperature is low, is incapable of causing its appearance.

Effects of Acidity.—In making wort cultures, it was found that the presence of 0.1 per cent. of acetic acid prevented the growth of the organism. Lactic acid has a similar effect. The author of the paper was, therefore, led to try the effect of the presence of small quantities of acid in the dough. A number of tests were made and the results recorded in which acetic acid in quantities varying from 0.3 to 1.06 lb. to the sack were used, and large amounts of wort culture added. The general result was that acetic acid in quantities of from 0.3 to 0.7 lb. to the sack inhibited the development of rope. The minimum quantity would appear to be 0.3 lb., while any excess over 0.7 lb. injuriously affected the gluten. The smaller quantity of acetic acid is not prejudicial to the general qualities of the bread. Lactic acid may be employed instead of acetic acid, but the action is somewhat uncertain with quantities below 0.6 lb. per sack.

Summary.—Ropiness in bread is produced by varieties of *B. mesentericus* (Flugge), introduced into the dough through the flour, in which it sometimes occurs in large numbers, possibly coming from the bran coatings. Breads containing bran and low-grade white flours are most prone to develop ropiness. The bacillus is a prolific spore former, the spores being capable of resisting high temperatures for prolonged periods. Once present in the dough, development of the bacillus, after bread has been made, depends partly upon the reaction of the bread, and partly upon atmospheric conditions. Bread is only faintly acid in reaction, and always insufficiently so to naturally prevent the development and spread of ropiness, but if the acidity be increased by addition of small quantities of acetic acid to the dough, development can be prevented. Low temperature and dryness of the bread store tend to suppress development, but the maximum temperature of 18 deg. C. (65 deg. F.) cannot be exceeded without great risk. When a batch of bread is found to be ropy, all flour in stock should be at once tested, so as to locate the infected stock, and in the meantime fresh supplies of flour from a different source should be laid in.

Black Spot in Tomatoes.

E.M.H. (Broomie)—

Mr. J. M. Ward, Chief Instructor in Fruit Culture, advises:—

Spray with Bordeaux Mixture, at the strength of 3.3.40—that is, 3 lb. of bluestone, 3 lb. lime, to 40 gallons of water.

Bordeaux Mixture is made by dissolving the bluestone (by using hot water will dissolve much quicker) in one gallon of water, slake the lime, and make up each to about 5 gallons of water, pouring both liquids into a third vessel, adding sufficient water to make up to 40 gallons.

The milk of lime should first be passed through cheese cloth or some other material, for the purpose of straining.

The first spray to be applied when flowering commences, and to be followed by one or two later applications.

Cotton Culture.

C.H.H.G. (Gayndah)—

The Cotton Adviser (Mr. W. G. Wells) replies:—It is suggested that the location of your cotton field in regard to the possibility of early frosts should be taken into consideration before expending any more labour on cultivation. I have not had sufficient experience in Queensland to know, nor does there seem to be any data, as to just what length of time of frost-free conditions are necessary to develop the topmost squares of a cotton plant into open mature bolls. Consequently, it is difficult to advise one as to just what percentage of the top crop of squares (small flower buds) will develop this season.

Roughly speaking, it usually takes a period of about thirty days from the appearance of the small square to the full opening of the flower, and from forty-five to sixty days from the opening of the flower to the opening of the matured boll. Under the droughty conditions of this year, the development of both the flower bud and the matured boll has been greatly hastened in some districts, many of the bolls opening far in advance of the time anticipated. It is, therefore, possible that a continuation of the present droughty conditions may cause a forced development of the top crop of squares, and resulting in an early opening of the top crop of bolls, although it is also possible that there is not sufficient moisture in the soil to fully develop the bolls formed from the late squares. You will, therefore, have to take into consideration the abovementioned points, as well as the size of the plants, before deciding whether it is advisable to expend the amount of labour sufficient to develop a good moisture retaining mulch of the surface soils.

In regard to the picking of the open cotton, I would suggest that you pay considerable attention to the grade of the picking, in order to have only one grade of cotton in each bale or whatever container you use to ship the seed cotton to the ginnery. There may be enough variation in the colour of the cotton to warrant penalising the dark coloured portions, thereby lessening the value per lb. of the whole bale of cotton, especially if any of the blackish stained "unfluffed" locks are accidentally included, so it is highly advisable not only to pick cotton free of all trash and leaves, but also free of any serious discolouration; although I might say that the slightly yellowish-tinged cotton, not the dark-brown or black, which was caused by the early March rains on the lower crop of opened bolls, may go into the regular cotton if not present to too great a degree.

The Farmers' Feathered Friends.

R.C.F. (Innisfail) writes suggesting the periodical publication of a list of protected birds, and says: "There is too much ignorance among folk who shoot their friends. Knowledge of their value as pest destroyers can only be broadcasted by the Press." Complete information on the subject will appear in the May Journal.

Farm and Garden Notes for May.

Field.—May is usually a busy month with the farmer—more particularly the wheatgrower, with whom the final preparation of his land prior to sowing is the one important operation. Late maturing varieties should be in the ground by the middle of the month at the latest.

Cleveland, intended primarily for feeding off, should be sown not later than the end of April.

The necessity of pickling all wheat intended for sowing purposes is again emphasised; and for general purposes, combined with economy in cost of material, the bluestone and lime solution holds its own. To those who desire an easier but somewhat more costly method of treatment, carbonate of copper at the rate of 1 oz. to the bushel and used in a dry form is suggested.

Potatoes, which in many districts are still somewhat backward, should have by this time received their final cultivation and hilling-up.

The sowing of prairie grass on scrub areas may be continued, but should be finished this month. This is an excellent winter grass, and does well in many parts of Southern Queensland.

Root crops, sowings of which were made during April, should now receive special attention in the matter of thinning out and keeping the soil surface well tilled to prevent undue evaporation of moisture.

Every effort should be made to secure sufficient supplies of fodder for stock during the winter, conserved either in the form of silage or hay.

Cotton crops are now fast approaching the final stages of harvesting. Information relative to the despatch of seed cotton for treatment is dealt with in another portion of this issue.

Kitchen Garden.—Onions which have been planted in seed beds may now be transplanted. The ground should long since have been thoroughly cleaned, pulverised, and should be rolled previous to transplanting. Onions may still be sown in the open on clean and well-prepared ground. In favourable weather plant out cabbages, lettuce, leeks, beetroot, endive, &c. Sowings may also be made of all these as well as of peas, broad beans, kohl-rabi, radishes, spinach, turnips, parsnips, and carrots, and, where sufficiently large enough, thinned out. Dig and prepare beds for asparagus, using plenty of well-rotted farmyard manure.

Flower Garden.—Planting and transplanting may be carried out simultaneously during this month in showery weather; the plants will thus be fully established before the early frosts set in. Camellias and gardenias may be safely transplanted, also such soft-wooded plants as verbenas, petunias, pentstemons, heliotrope, &c. Cut back and prune all trees and shrubs ready for digging. Dahlia roots should be taken up and placed in a shady situation out of doors. Plant bulbs, such as anemones, ranunculus, snowflakes, freesias, ixias, watsonias, iris, narcissus, daffodils, &c. Tulips will not suit the Queensland climate, but hyacinths may be tried, although success is doubtful. All shades and screens may now be removed to enable the plants to get the full benefit of the air. Fork in the mulching, and keep the walks free from weeds. Clip hedges and edgings.

Orchard Notes for May.

THE COAST DISTRICTS.

In these notes for the past two months the attention of citrus-growers has been called to the extreme importance of their taking every possible care in gathering, handling, packing, and marketing, as the heavy losses that frequently occur in Southern shipments can only be prevented by so treating the fruit that it is not bruised or otherwise injured. It has been pointed out that no citrus fruit in which the skin is perfect and free from injury of any kind can become specked or blue-mouldy, as the fungus causing the trouble cannot obtain an entry into any fruit in which the skin is intact. Growers are, therefore, again warned of the risk they run by sending blemished fruit South, and are urged to exercise the greatest care in the handling of their fruit. No sounder advice has been given in these notes than that dealing with the gathering, handling, grading, packing, and marketing, not only of citrus, but of all other classes of fruit.

It is equally as important to know how to dispose of fruit to the best advantage as it is to know how to grow it. To say the least, it is very bad business to go to the expense of planting and caring for an orchard until it becomes productive and then neglect to take the necessary care in the marketing of the resultant crop. Main crop lemons should be cut and cured now, instead of being allowed to remain on the tree to develop thick skins and coarseness. As soon as the fruit shows the first signs of colour or is large enough to cure down to about from 2¼ to 2½ in. in diameter, it should be picked, care being taken to handle it very gently, as the secret of successfully curing and keeping this fruit is to see that the skin is not injured in the slightest, as even very slight injuries induce decay or specking. All citrus fruits must be sweated for at least seven days before being sent to the Southern States, as this permits of the majority of specky or fly-infested fruits being rejected. Citrus trees may be planted during this month, provided the land has been properly prepared and is in a fit state to receive them; if not, it is better to delay the planting till the land is right.

In planting, always see that the ground immediately below the base of the tree is well broken up, so that the main roots can penetrate deeply into the soil and not run on the surface. If this is done and the trees are planted so that the roots are given a downward tendency, and all roots tending to grow on or near the surface are removed, the tree will have a much better hold of the soil and, owing to the absence of purely surface roots, the land can be kept well and deeply cultivated, and be thus able to retain an adequate supply of moisture in dry periods. No not forget to prune well back when planting, or to cut away all broken roots.

All orchards, pineapple and banana plantations should be kept clean and free from all weed growth, and the soil should be well worked so as to retain moisture.

Custard apples will be coming forward in quantity, and the greatest care should be taken to see that they are properly graded and packed for the Southern markets, only one layer of one sized fruit being packed in the special cases provided for this fruit—cases which permit of the packing of fruit ranging from 4 to 6 in. in diameter in a single layer.

Slowly acting manures—such as meatworks manures—may be applied to orchards and vineyards during the month; and lime can be applied where necessary. Land intended for planting with pineapples or bananas during the coming spring can be got ready now, as, in the case of pineapples, it is a good plan to allow the land to lie fallow and sweeten for some time before planting; and, in the case of bananas, scrub fallen now gets a good chance of drying thoroughly before it is fired in spring, a good burn being thus secured.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Clean up all orchards and vineyards, destroy all weeds and rubbish likely to harbour fruit pests of any kind, and keep the surface of the soil well stirred, so as to give birds and predaceous insects every chance to destroy any fruit fly pupæ which may be harbouring in the soil. If this is done, many pests that would otherwise find shelter and thus be able to live through the winter will be exposed to both natural enemies and cold.

Further, it is a good plan to clean up the land before pruning takes place as, if delayed till the pruning has been finished, the land is apt to dry out in a droughty season.

Pruning can be started on such varieties as have shed their leaves towards the end of the month, as it is a good plan to get this work through as early in the season as possible, instead of putting it off until spring. Early-pruned trees develop their buds better than those pruned late in the season. These remarks refer to trees—*not vines*, as the later vines are pruned in the season the better in the Granite Belt District, as late pruned vines stand a better chance to escape injury by late spring frosts.

All worthless, badly diseased, or worn-out trees that are no longer profitable, and which are not worth working over, should be taken out now and burnt, as they are only a menace and a harbour for pests.

Land intended for planting should be got ready as soon as possible, as, if ploughed up roughly and allowed to remain exposed to the winter frosts, it will become sweetened and the trees planted in it will come away much better than if set out in raw land. In any case the land must be properly prepared, for once the trees are planted it is a difficult matter to get the whole of the land as well worked as is possible prior to planting.

Slowly acting manures—such as ground island phosphates or basic phosphates—may be applied to orchards and vineyards. They are not easily washed out of the soil, and will become slowly available and thus ready for the use of the trees or vines during their spring growth. Lime may also be applied where necessary.

This is a good time to attend to any drains—surface, cut-off, or underground. The two former should be cleaned out, and in the case of the latter all outlets should be examined to see that they are quite clear and that there is a good getaway for the drainage water. New drains may also be put in where required.

In the warmer parts citrus fruits will be ready for marketing, and lemons ready for cutting and curing. The same advice that has been given with respect to coast-grown fruit applies equally to that grown inland; and growers will find that careful handling of the fruit will pay them well. Lemons grown inland are, as a rule, of superior quality to those grown on the coast, but are apt to become too large if left too long on the trees, so it is advisable to cut and cure them as soon as they are ready. If this is done and they are properly handled, they may be kept for months, and will be equal to any that are imported.

If the weather is very dry, citrus trees may require an irrigation, but, unless the trees are showing signs of distress, it is better to depend on the cultivation of the soil to retain the necessary moisture, as the application of water now is apt to cause the fruit to become soft and puffy, so that it will not keep or carry well.

Land intended for new orchards should be got ready at once, as it is advisable to plant fairly early in the season in order that the trees may become established before the weather again becomes hot and dry. If the ground is dry at the time of planting, set the trees in the usual manner and cover the roots with a little soil; then give them a good soaking; and when the water has soaked into the soil, fill the hole with dry soil. This is much better than surface watering.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET.

AT WARWICK.

1923.	APRIL.		MAY.		JUNE.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·3	5·49	6·20	5·19	6·37	5·2
2	6·4	5·48	6·20	5·18	6·37	5·2
3	6·4	5·47	6·21	5·17	6·38	5·2
4	6·5	5·46	6·21	5·16	6·38	5·2
5	6·5	5·45	6·22	5·15	6·39	5·1
6	6·6	5·44	5·22	5·14	6·39	5·1
7	6·6	5·43	6·23	5·13	6·40	5·1
8	6·7	5·42	6·23	5·13	6·40	5·1
9	6·7	5·41	6·24	5·12	6·41	5·1
10	6·8	5·40	6·24	5·12	6·41	5·1
11	6·8	5·39	6·25	5·11	6·41	5·1
12	6·9	5·37	6·26	5·11	6·42	5·1
13	6·9	5·36	6·26	5·10	6·42	5·1
14	6·10	5·35	6·27	5·10	6·42	5·1
15	6·10	5·34	6·27	5·9	6·42	5·2
16	6·11	5·32	6·28	5·8	6·43	5·2
17	6·11	5·31	6·29	5·8	6·43	5·2
18	6·12	5·30	6·29	5·7	6·43	5·2
19	6·12	5·29	6·30	5·7	6·43	5·2
20	6·13	5·28	5·30	5·6	6·44	5·2
21	6·14	5·27	6·31	5·6	6·44	5·2
22	6·14	5·26	6·31	5·5	6·44	5·2
23	6·15	5·25	6·32	5·5	6·44	5·3
24	6·15	5·24	6·32	5·4	6·44	5·3
25	6·16	5·23	6·33	5·4	6·45	5·3
26	6·17	5·22	6·34	5·4	6·45	5·4
27	6·17	5·21	6·34	5·3	6·45	5·4
28	6·18	5·21	6·35	5·3	6·45	5·4
29	6·18	5·20	6·35	5·3	6·45	5·5
30	6·19	5·20	6·36	5·3	6·45	5·5
31	...	...	6·36	5·2	...	...

PHASES OF THE MOON, OCCULTATIONS, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania when "Summer" Time is not used.

1 April ○ Full Moon 11 10 p.m.
8 „ ☽ Last Quarter 3 22 p.m.
16 „ ● New Moon 4 28 p.m.
24 „ ☾ First Quarter 3 20 p.m.

Perigee on 2nd at 7.24 a.m., and 30th at 6.24 p.m.

The Full Moon will be apparently very near to Saturn and Spica on the nights of April 1 and 2.

On the 19th the Moon in Crescent form will pass Mars soon after Sunset.

On Sunday, 29th April, an interesting Occultation of Saturn will take place about 5 p.m., Saturn reappearing about 6 p.m. Saturn will also be Occulted on 26th May, about Midnight.

---

1 May ○ Full Moon 7 30 a.m.
8 „ ☽ Last Quarter 4 18 a.m.
16 „ ● New Moon 8 38 a.m.
24 „ ☾ First Quarter 12 25 p.m.
30 „ ○ Full Moon 3 7 p.m.

Apogee on the 13th, at 2.48 p.m.
Perigee on the 29th, at 1.48 a.m.

Jupiter will be in opposition to the Sun at Midnight on the 5th, when it will be nearly overhead.

Mercury being at its greatest eastern elongation about the 5th should be visible between the Pleiades and Hyades soon after Sunset.

---

6 June ☽ Last Quarter 7 19 p.m.
14 „ ● New Moon 10 42 p.m
22 „ ☾ First Quarter 6 46 a m.
28 „ ○ Full Moon 11 4 p.m.

Apogee on the 10th, at 4.30 a.m.
Perigee on the 25th, at 11.30 p.m.

About an hour before Sunrise on the 12th the Moon in Crescent form and the beautiful planet Venus will afford a fine celestial picture somewhat low down in the East with the Pleiades north of them.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter, and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]